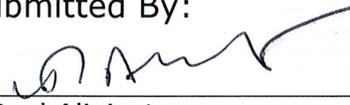


Worker Safety and Health Program

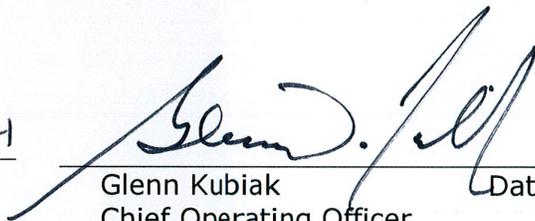
Lawrence Berkeley National Laboratory

Submitted By:



 Paul Alivisatos
 Director
 Lawrence Berkeley
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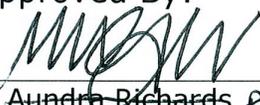
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Record of Revisions

Rev. No.	Date	Description
1	May 2008	<ul style="list-style-type: none"> • Updated references to account for Rev 6. of PUB-3140, ISMS Management Plan of September 2007 and for revision made to ES&H MANUAL throughout the year (throughout document) • Expanded JHA Program Discussion (Sec. 7.6) to address current implementation of this program, which was a pilot in 2007; references to JAQ process replaced by JHA (Sec. 10) • Updated Section 12. Variances..., to address updates made to Electrical AHJ delegation and clarifications made for other subjects • Updated list of Closure Facilities (Sec 7.9 & Appx E), list of LBNL Offsite Leased Facilities (Appx B), and added MOU for JBEI to Appendix C. • Added Appendix F-11 for Engineered Nanoparticles • Minor housekeeping revisions made throughout.
2	June 2009	<ul style="list-style-type: none"> • Sec 1, 1.4: added explicit references to LBNL Rule compliance assurance effort and DOE ability to impose civil penalties. • Sec 1.6: Updated descriptions of flow down of 851 requirements to subcontractors. • Sec 3: Updates language describing institutional and activity-level implementation of Rule requirements, changed language from Worksmart Standards Set (WSS) to ES&H Standards • Sec 7.6: Updated description of JHA process • Updated list of Closure Facilities (Sec 7.9 & Appx E), list of LBNL Offsite Leased Facilities (Appx B), • Sec 9: Change reference from WSS to ES&H Standards • Sec 10 Training: Updated training requirements. • Sec 11 Change responsibility for Occurrence Reporting from OCA to EHSD • Minor housekeeping revisions made throughout.
2.1	November 2010	<ul style="list-style-type: none"> • Sec 7.2 updated to point to new ES&H MANUAL Exposure Assessment section 4.18. • Sec 7.6 updated to describe improvements made to JHA process • Sec 12.2. Laser Safety AHJ was delegated to LBL • Appendix F 7 updated to describe revisions to Fire Protection Baseline Needs Assessment. • Minor housekeeping revisions made throughout.
2.2	March 2012	<ul style="list-style-type: none"> • Sec. 3: Updated Document Hierarchy figure. • Sec 11: Updated DOE WSH Noncompliance Reporting Criteria table • Minor housekeeping revisions made throughout.

Rev. No.	Date	Description
3	June 2014	<ul style="list-style-type: none"> • Updated references to account for Rev 8. of PUB-3140, <i>ISMS Management Plan</i> of July 2013, for revisions made to the ES&H MANUAL (throughout document), and for reformatting of the RPM. • Updated Sections 7.6 and 7.7 regarding Work Authorization processes • Section 9. Safety and Health Standards updated to identify updated standards for Laser Safety and Electrical Safety • Section 10. Training updated to reflect program improvements • Updated Section 12. Variances..., to address updates made to Electrical AHJ delegation and clarifications made for other subjects • Appendix F-6 Industrial Hygiene revised to reflect program reorganization • Appendix F-8 Occupational Medicine revised to reflect program changes • Appendix F-12 Workplace Violence Prevention completed with reference to new RPM policy • Minor housekeeping revisions made throughout.

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Executive Summary

Title 10 of the Code of Federal Regulations, Part 851 (10 CFR 851), Worker Safety and Health Program, requires Department of Energy (DOE) sites to establish a worker protection program that will reduce or prevent the potential for injuries, illnesses, and accidental losses by providing workers with a safe and healthful workplace. This document (PUB-3851) describes the Worker Safety and Health Program (WSHP) that has been developed at Lawrence Berkeley National Laboratory (LBNL or Berkeley Lab), a DOE site, to comply with 10 CFR 851. The LBNL Worker Safety and Health Program is referred to as either “the WSHP” or “the Program,” and 10 CFR 851 as “the Rule.”

Berkeley Lab, which is a multiprogram national research and development laboratory managed by the University of California for DOE, is located on land belonging to the Regents of the University of California and operated primarily with funding from DOE. It performs research in advanced materials, life sciences, computing sciences, energy efficiency, detectors, and accelerators to serve the United States’ needs in technology and the environment; is organized into 14 scientific divisions; and hosts six DOE national user facilities. Berkeley Lab employs approximately 4,200 personnel, of which about 1,000 are students. Each year, the Laboratory also hosts more than 3,300 affiliates.

The Rule, and thus the Program, applies to design, construction, operation, maintenance, decontamination and decommissioning, research and development, and environmental restoration activities for DOE funded and controlled activities that take place at the Berkeley Lab main site, Donner Laboratory on the University of California (UC) Berkeley main campus, the Production Genomics Facility of the Joint Genome Institute (JGI) in Walnut Creek, Berkeley Biosciences West in Berkeley, the National Energy Research Scientific Computing (NERSC) Center, the Joint BioEnergy Institute (JBEI) in Emeryville, and other spaces leased by Berkeley Lab as defined by the Program. Building maintenance performed by a landlord at leased space always falls outside of the Rule’s jurisdiction as worker safety and health regulations would be covered, in California, by Cal/OSHA.

The Program does not address radiological or environmental hazards associated with DOE activities. References to environment, safety, and health (ES&H) in this document are limited to the protection of workers from workplace safety and health hazards. Environmental management is outside the scope of the Program. These

programs are integrated into Berkeley Lab's overall ES&H Program through the Integrated Safety Management Plan and the Environment, Health and Safety Manual.

The Rule is implemented by the Program, which integrates the safety and health regulations and standards required by the Rule, components of the LBNL Integrated Safety Management System (ISMS) Management Plan, and other components of the LBNL ES&H Program. The Program is in turn implemented by Berkeley Lab documents that guide health and safety policies for workers, such as applicable sections of the Environment, Health and Safety Manual (PUB-3000), the Regulations and Procedures Manual (RPM), Division Integrated Safety Management (ISM) Plans, and the Quality Assurance Program Description (QAPD, PUB-3111). For the purposes of compliance and enforcement by DOE, the documents that are referenced in the WSHP are enforceable standards. The embedded standards referenced in these incorporated documents are also considered to be enforceable and are incorporated into the WSHP for enforcement purposes. Where specific subsections of documents are cited, only those subsections are incorporated by reference. Citations of specific sections of the ISMS, ESH Manual, RPM, or QAPD refer to the most current version of these documents available at the time the Worker Safety and Health Program, Revision 3, was published.

The major aspects of the Program are:

- Management responsibilities, including ensuring that workers are qualified for their assignments, accountability, reporting events and hazards, responding to events and hazards reports, informing workers of their rights, and communicating safety and health policies
- Workers' rights, including the right to participate in safety activities on official time, having access to health and safety information, observing monitoring, receiving notification of monitoring results, accompanying auditors during inspections, addressing concerns without fear of reprisal, and refusing to work and stopping work to prevent an injury
- Workers' responsibilities, including following Berkeley Lab safety policies and reporting hazards, injuries, and illnesses
- Identification and assessment of hazards associated with work activities and facilities

- Controls to prevent and abate hazards associated with work activities and facilities
- Safety and health standards
- The Berkeley Lab training programs, which ensure that all workers have the skills, knowledge, and abilities to carry out their responsibilities safely
- Record keeping and reporting
- Resolving noncompliance conditions
- Enforcement of the Rule
- Berkeley Lab programs and their implementation mechanisms in construction safety, fire protection, pressure safety, electrical safety, industrial hygiene, occupational medicine, biological safety, and motor vehicle safety

The Rule requires an annual review of the WSH Program and, if necessary, the revision of this document to address changes that may have occurred. In 2007, this document was updated to include changes made to the ISMS Management Plan. In 2008 and early 2009, EHS efforts were directed toward the implementation of the Job Hazards Analysis (JHA, activity level work planning and control) for all workers, the implementation of subcontractor flow-down of Rule requirements, and the management of external assessment and self-assessments of ES&H programs with their associated Corrective Action Plans (CAPs), among others. These efforts did not drive substantial changes to this WSHP document; however, they led to the revision of many of the activity-level-implementing documents it references.

Revision 2.1 for 2010 was a minor change that described improvements made to the Employee Exposure Assessment process; the Worker Job Hazard Analysis process; and the Fire Prevention Program Baseline Needs Assessment. It recognized that responsibility for the Laser Safety AHJ was delegated to LBNL.

Revision 2.2 was also a minor change. It updated the LBNL Document Hierarchy document associated with improvements to the Requirements Management process, revision and reorganization of references (web-links), and included the 2012 update to the DOE Worker Safety and Health Noncompliance Reporting Criteria.

Revision 3, the current revision is a significant update to reflect changes made to the ISM Management Plan in 2013. It also captures the significant revisions that were

made to the ES&H Manual (PUB-3000) and the Requirements and Policies Manual (RPM) through the Requirements Management improvement project. The Authority Having Jurisdiction (AHJ) description is updated to reflect significant improvements to that process. The Functional Area appendices have been revised to reflect functional and administrative changes made to realign resources with risks.

1. Introduction

Title 10 of the Code of Federal Regulations (CFR), Part 851 (10 CFR 851), Worker Safety and Health Program (WSHP), requires DOE sites to establish a worker protection program that will reduce or prevent the potential for injuries, illnesses, and accidental losses by providing workers with a safe and healthful workplace. It allows DOE to impose civil penalties for violations of requirements of the Rule.

This document describes the WSHP that has been developed at Berkeley Lab to comply with 10 CFR 851. The WSHP includes the regulations and standards specifically required by 10 CFR 851, and elements of Berkeley Lab ISMS. To demonstrate how the Laboratory complies with each applicable 10 CFR 851 requirement, the content of this WSHP document has been organized to follow the contents of the Rule.

Appendix A contains a glossary of the acronyms and key terms used in this document.

1.1 Work Activities

Work performed at Berkeley Lab focuses primarily on energy and the environment; biosciences and biotechnology; and fundamental science and applied technology.

Since its inception, Berkeley Lab's location on the hillside above the University of California at Berkeley has offered a unique opportunity for scientific and academic partnerships and has helped to foster the academic excellence that is the hallmark of the Laboratory's scientific endeavors. Of Berkeley Lab's staff of approximately 4,200, more than 250 faculty/scientists hold joint appointments with UC Berkeley and other UC campuses. In addition, nearly 1,000 students and postdoctoral fellows are employed each year, along with more than 3,300 affiliates from institutions around the world.

In addition to its fundamental research, Berkeley Lab's research centers and user facilities provide intellectual resources, services, infrastructure, and unique experimental facilities not found anywhere else in the world. They include the Advanced Light Source (ALS), the National Energy Research Scientific Computing (NERSC) Center, the Energy Sciences Network (ESnet), the Molecular Foundry, the National Center for Electron Microscopy (NCEM), the Joint Genome Institute (JGI), and the Joint BioEnergy Institute (JBEI).

1.2 Locations

The DOE Worker Safety and Health Rule (10 CFR 851) and this Program apply to work at the following Berkeley Lab locations. Building maintenance performed by a landlord at leased space always falls outside of the Rule's jurisdiction as worker safety and health regulations would be covered, in California, by Cal/OSHA.

- The Berkeley Lab main site
- Donner Hall on the UC Berkeley main campus
- The JGI in Walnut Creek
- Berkeley Biosciences West (Potter Street) in Berkeley
- NERSC
- JBEI in Emeryville
- Other spaces leased for Berkeley Lab as defined in Appendix B

1.3 Workforce

In 2014, Berkeley Lab has approximately 4,200 employees, including approximately 1,700 scientists and engineers and 1,000 students and postdoctoral fellows, along with more than 3,300 affiliates from institutions around the world.

1.4 Purpose

The purpose of the WSHP is to ensure that Berkeley Lab provides a safe and healthful workplace in which hazards are abated, controlled, or otherwise mitigated, providing reasonable assurance that workers are adequately protected from identified hazards that can potentially cause physical harm or death. The WSHP also provides mechanisms for the Laboratory to identify incidents of noncompliance with requirements so that they can be resolved and appropriately documented to minimize civil penalties.

1.5 Scope

The Berkeley Lab WSHP applies to DOE contractor activities that are performed at Laboratory sites (including JGI and JBEI; see note below) listed in Section 1.2 and Appendix B of this document. The Rule defines a contractor as "any entity, including affiliated entities, such as a parent corporation, under contract with DOE, including a subcontractor at any tier, with responsibility for performing work at a DOE site in furtherance of a DOE mission." The Rule and thus the Program apply to design, construction, operation, maintenance, decontamination and decommissioning, research

and development, and environmental restoration activities performed at LBNL-controlled sites.

Berkeley Lab is a single DOE contractor work site; thus, the multi-DOE contractor workplace coordination requirements contained in Section 851.11(a)(2)(i) and (ii) of the Rule do not apply.

There is a Memorandum of Understanding (MOU) that provides specific guidance on ES&H responsibilities and coordination between JGI and its two managing laboratories, Lawrence Berkeley National Laboratory and Lawrence Livermore National Laboratory. Appendix A of the MOU specifically assigns responsibility for providing 10 CFR 851 compliance oversight to Berkeley Lab. JBEI utilizes the Berkeley Lab WSHP to provide a framework for its comprehensive program to reduce injuries, illnesses, and enhance safety performance at the JBEI facility. A complete list of EHS MOUs and Agreements is found in Appendix C.

References:

- [November 7, 2006, JGI MOU \(Regarding ES&H\)](#)
- [November 19, 2007, JBEI ES&H MOU](#)

1.6 Flow Down of 851 Requirements to Subcontractors

All subcontractors who perform work at Berkeley Lab sites must comply with the provisions of 10 CFR 851 Worker Safety and Health Program. Berkeley Lab flows down these requirements to subcontractors and their employees through Contract terms and conditions. This flow down of safety and health requirements ensures that the safety and health activities of subcontractors are integrated with Laboratory activities.

Subcontractors who perform hands-on work at Berkeley Lab are required to submit safety assurance documents appropriate for their scope of work. These documents typically include scope of work, job hazards analysis, and special permits and work authorizations. Before work can begin, these documents must be approved by Berkeley Lab. During the performance of subcontractor work, Berkeley Lab provides oversight that is commensurate with the work hazards. The safety assurance processes for construction and non-construction subcontractors are documented in ES&H Manual Chapters 10 and 31, respectively.

References:

- [ES&H Manual, Chapter 10, Construction Safety Manual Administrative Policies](#)
- [ES&H Manual, Chapter 31, Non-Construction Safety Assurance for Subcontractors, Vendors, and Guests at LBNL Facilities Job Hazards Analysis](#)

1.7 Coordination with Labor Organizations

In the development of its WSHP, Berkeley Lab believes that it is important to seek input from labor organizations that represent Laboratory employees as well as nonrepresented Laboratory employees. As such, it is Berkeley Lab's desire to communicate the development and implementation of its WSHP. Where the Program affects the terms and conditions of employment and as well as those requested by the union, Berkeley Lab will meet with employee representatives to discuss applicable federal and state labor laws, and will provide them with a copy of the approved Program at no cost. Prior to the submittal of subsequent updates of the Program, or whenever there is a significant change, Berkeley Lab will inform and provide an opportunity to meet with employee representatives to give them timely notice to seek comments regarding the change. Under the Laboratory's Environment, Safety and Health Manual (ES&H Manual, PUB-3000), employee representatives will be able to exercise their rights as described by the Program, including right to accompany the Laboratory Director or his/her authorized personnel to help them inspect the workplace.

1.8 Exclusions

The Program does not address radiological or environmental hazards associated with DOE activities. Radiological hazards are addressed in 10 CFR 820, 10 CFR 830, and 10 CFR 835 in a comprehensive manner through methods such as the Quality Assurance Program, Radiation Protection Program, safety basis, and documented safety analysis.

References to ES&H in this document are limited to the protection of workers from workplace safety and health hazards. Environmental management is outside the scope of the Program.

The Program does not apply to DOE activities performed away from DOE sites, such as transportation activities to and from DOE sites, and does not apply to work at locations that are regulated by the Occupational Safety and Health Administration (OSHA), such as research field work conducted at locations not at that do not have a definable mailing address, nor does this Program apply to Berkeley Lab-related work performed at the UC Berkeley campus that is carried out in accordance with the MOU dated March 15, 2004, and updated in August 2008, covered by the "Partnership Agreement Between UCB and LBNL Concerning Environment, Health, and Safety Policy and Procedures.". This document delineates responsibility and oversight of safety requirements for work carried out in LBNL and campus spaces. It establishes a clear

expectation that LBNL managers will take the initiative in following locally applicable ES&H rules, and specifies that work carried out at LBNL controlled spaces, including Donner Laboratory, is carried out in accordance with LBNL rules, and that work carried out at UCB is governed by UCB rules.

References:

- [ISMS Management Plan, Section 5.8 Interface within UC Berkeley ES&H Department](#)
- [Partnership Agreement Between UCB and LBNL Concerning Environment, Health and Safety Policy and Procedures, updated August 2008](#)

1.9 DOE Office of Science (SC) Berkeley Site Office (BSO) Manager

Paul Golan is the acting DOE-SC BSO Manager.

1.10 DOE Approval

The first WSHP document had to be submitted to the DOE-SC BSO Manager by February 26, 2007, and approved no later than May 25, 2007, or no further work could be performed. Thereafter, on an annual basis, Berkeley Lab must submit to the DOE-SC BSO Manager either an updated WSHP for approval, or a letter stating that no changes are necessary in the currently approved Program.

1.11 Revisions

Significant revisions to the Program must be submitted to the DOE-SC BSO Manager for approval. A revision is considered significant when it is needed to ensure that the Program accurately reflects actual workplace activities, hazards, controls, and approved Program roles and responsibilities.

The first WSHP document was approved April 27, 2007. The 2008 review resulted in sufficient changes, requiring a revision of the Program document. This document, Revision 3, includes many minor revisions necessary to update the description to current conditions. For a list of changes, see the Record of Revisions.

2. Compliance

Berkeley Lab must comply with all the requirements of the Rule. Compliance is achieved by the Berkeley Lab WSHP, as described in this document, which incorporates relevant sections of documents such as the ES&H Manual (PUB-3000), the Requirements and Policies Manual (RPM), and the Quality Assurance Program Description (QAPD, PUB-3111).

2.1 Berkeley Lab ES&H Program

Pursuant to DOE/LBNL [Contract No. DE-AC02-05CH11231](#), Berkeley Lab has an established ES&H Program, which has been used as the foundation for the development of the Berkeley Lab WSHP described in this document.

2.2 Integrated Safety Management System (ISMS)

Berkeley Lab is required by DOE Policy 450.4A and its operating contract to have an ISMS in place. DOE and its contractors such as Berkeley Lab are committed to achieving a work environment in which all operations and work activities are supported by safety management systems that ensure the protection of the public, the worker, and the environment. ISM is a systematic approach to integrating safety into management, work planning, and execution at all levels. ISMS core principles, functions, and goals are shown in Figure 1.

The basis of ISMS is discussed in the Berkeley Lab ISMS Plan. Institutional requirements for all work activities at the Laboratory are contained in the ISMS Plan and implemented by referenced ES&H MANUAL chapters and sections, the RPM, and the QAPD (PUB-3111). The ISMS Plan is maintained and updated by an annual review and approval process.

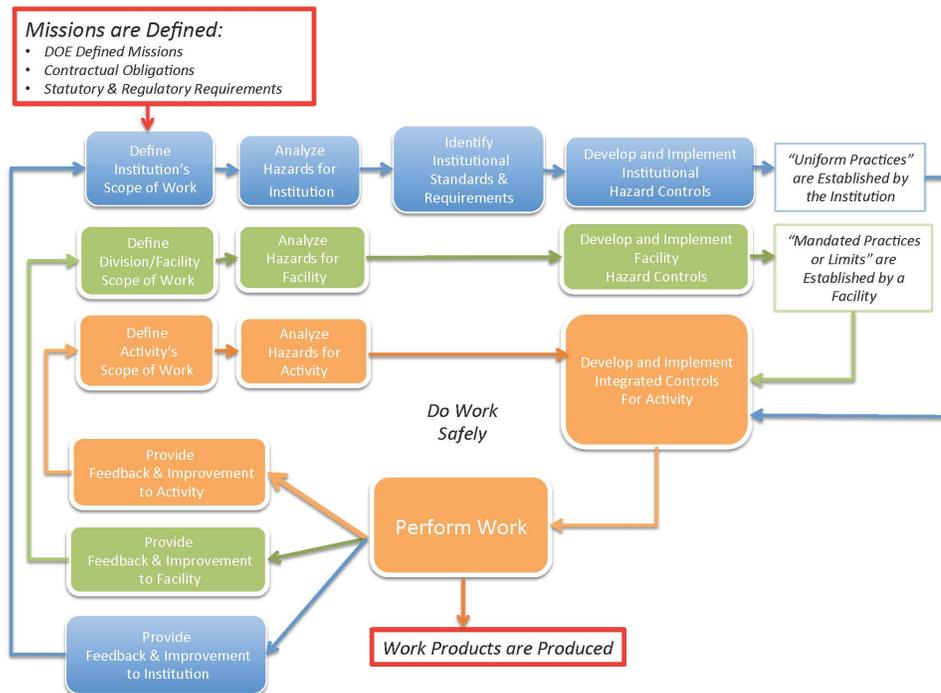


Figure 1. LBNL ISMS

2.3 Enforcement Process and Compliance Orders

DOE may initiate and conduct investigations and inspections relating to the scope, nature, and extent of Berkeley Lab’s compliance with 10 CFR 851. Additionally, any worker or worker’s representative may request that DOE initiate an investigation or inspection. DOE Enforcement Officers have the right to enter work areas without delay, to the extent practicable, to conduct inspections. Berkeley Lab will fully cooperate with DOE during all phases of the enforcement process and provide complete and accurate records and documentation as requested during investigation or inspection activities. DOE must inform Berkeley Lab of the general purpose of the investigation or inspection in writing at the initiation of the investigation or inspection.

Should DOE initiate an enforcement action as the result of an investigation or inspection, Berkeley Lab will respond to the enforcement action in the following manner as appropriate and as specified in Sections 851.40, 851.41, 851.42, 851.43, and 851.44 of the Rule:

- Request a settlement conference

- Respond to a consent order
- Respond to a Preliminary Notice of Violation
- Respond to a Final Notice of Violation
- Petition the Office of Hearings and Appeals for review of a Final Notice of Violation
- Respond to a Compliance Order

In accordance with Section 851.4 of the Rule, the Secretary may issue to any contractor a Compliance Order that: (1) identifies a situation that violates, potentially violates, or otherwise is inconsistent with a requirement of the Rule; (2) mandates a remedy, work stoppage, or other action; and (3) states the reasons for the remedy, work stoppage, or other action. A copy of any such Compliance Order issued by the Secretary will be prominently posted by Berkeley Lab at or near the location where the violation, potential violation, or inconsistency occurred until it is corrected.

3. Implementation

At Berkeley Lab, 10 CFR 851 is implemented at the institutional and activity levels as shown in Figure 2. At the institutional level, the Rule is implemented by developing and updating the Berkeley Lab WSHP document (PUB-3851), which incorporates the regulations and standards required by 10 CFR 851, components of the Berkeley Lab ISM Plan (PUB-3140), and other components of the ES&H Program. During initial implementation of 10 CFR 851, specific portions of the existing ES&H program were used to demonstrate compliance with the Rule. When gaps were identified in 10 CFR 851 implementation, such as in the flow down of safety requirements to lower-tier subcontractors, new Laboratory business processes and program documents were developed and incorporated into existing EHS documents (for example, the publication of the new ES&H Manual Chapter 32), which were then referenced in the WSHP.

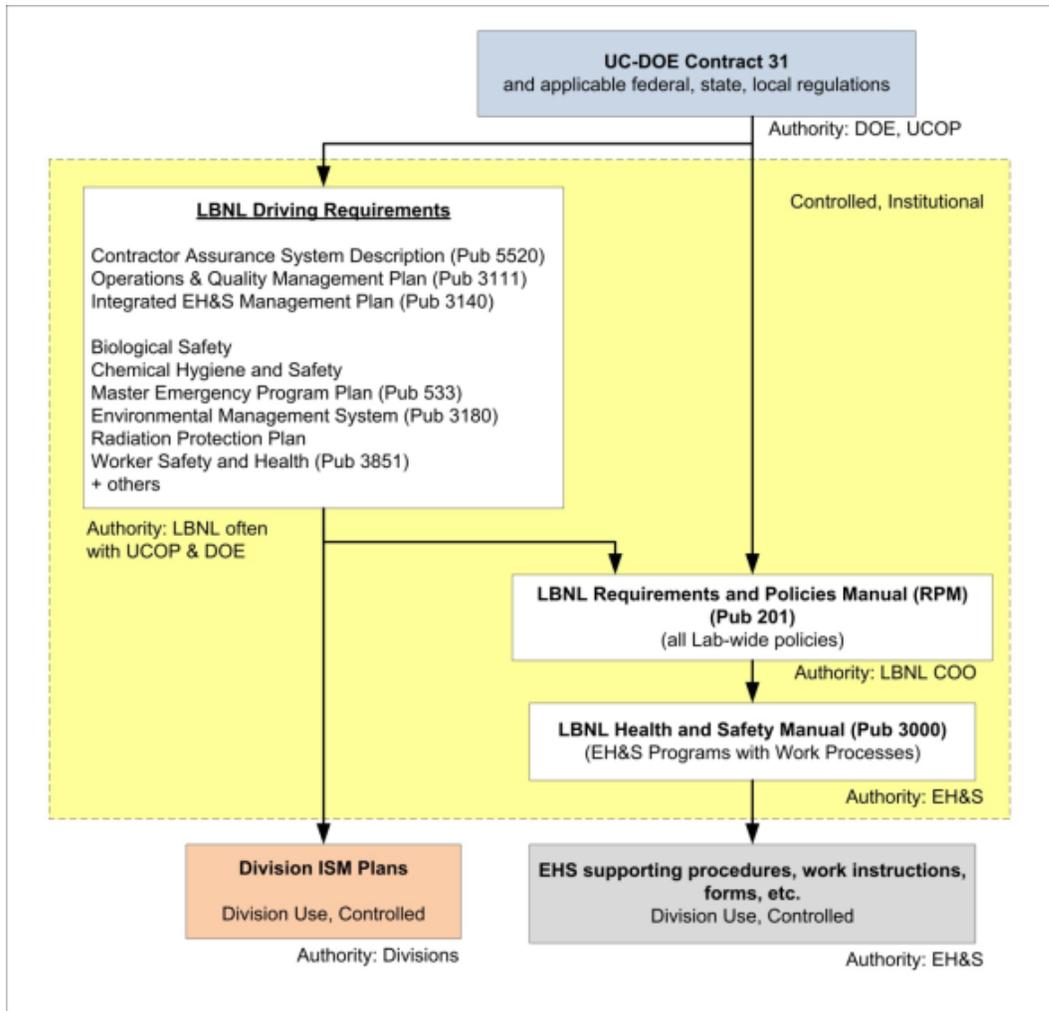


Figure 2. Two-Level Implementation of 10 CFR 851

At the activity level, the WSHP is implemented by Berkeley Lab documents that interface with workers, such as applicable sections of the ES&H Manual, the RPM, PUB-3111, and the Division ISM Implementation Plans. These documents contain information on how the management practices prescribed by the Berkeley Lab ISMS are implemented, how hazards that are associated with Berkeley Lab work activities are identified, how such hazards are controlled, and who is responsible for implementing the controls. In general, these are the references identified within the WSHP document. The WSHP cites the ISMS Plan as the institutional-level document that implements the ES&H Program.

For the purposes of compliance and enforcement by DOE, the documents that are referenced in the Berkeley Lab WSHP, enforceable standards. The embedded standards referenced in these incorporated documents are also considered to be enforceable and

are incorporated into the WSHP for enforcement purposes. Where specific subsections of documents are cited, only those subsections are incorporated by reference. Citations of specific sections of the ISMS Plan, the ES&H Manual, the Requirements and Policies Manual (RPM), and the Quality Assurance Program Description (QAPD, PUB-3111) refer to the most current version of these documents as of the date of publication of this document, the LBNL Worker Safety and Health Program (WSHP document).

4. Management Responsibilities

4.1 Safety Policy, ISMS Guiding Principles, ES&H Goals, and ES&H Objectives

It is the policy of Berkeley Lab to provide a safe and healthful working environment for its employees, affiliates, and other visitors; to prevent any harm to the health and safety of the general public or to the environment as a result of the Laboratory's activities; and to protect its property from damage or loss due to accidents or other causes.

References:

- [RPM, ES&H Core Policy](#)

Additionally, it is the policy of Berkeley Lab to conduct activities that contribute to its scientific and operational objectives in accordance with sound quality assurance and conduct of operations principles. These principles, as described in PUB-3111, are the basis for Berkeley Lab's standards for organization, process management, and performance assessments. Application of PUB-3111 principles is based on a graded approach, with consideration given to the Laboratory unit's mission, its programmatic or operational significance, and its environment, safety, and health consequences to personnel, the environment, and the general public.

References:

- [PUB-3111 \(Quality Assurance Program Description\), Objectives and Applicability](#)
- [RPM, Quality Assurance Policy](#)

Berkeley Lab is committed to performing all work safely and in a manner that strives to protect employees, affiliates, visitors, subcontractors, the public, and the environment from hazards, commensurate with the nature and scale of work. In addition, Berkeley

Lab seeks continuous improvement and sustained excellence in the quality of all ES&H programs.

To achieve these goals, Berkeley Lab has adopted the seven guiding principles and five core functions of the Integrated Safety Management System (ISMS), as prescribed in Department of Energy DEAR Clause 970.5204-2, which are reflected in the Laboratory's detailed policies and procedures.

References:

- [ISMS Management Plan, Chapter 4.0, ISMS System Overview](#)
- [RPM, ES&H Core Policy, ISM System Overview Tab](#)
- [RPM, EHS Division Charter](#)

Annual fiscal year (FY) safety and health performance objectives for Berkeley Lab are established within the [DOE/LBNL Contract No. DE-AC02-05CH11231](#). These fiscal year contract performance objectives are then subsequently reflected in the Laboratory's annual performance year divisional self-assessment performance objectives and criteria.

The FY 2014 safety and health performance objectives as stated in Section J, Appendix B, Goal 5 of the 2014 UC-DOE Contract includes:

- Provide an Efficient and Effective Worker Health and Safety Program
- Provide Efficient and Effective Environmental Management System

References:

- [PEMP, Appendix B, Attachment J-2, FY 2014 Performance Evaluation and Measurement Plan \(Contract No. DE-AC02-05CH11231\), Management and Operations Component, Goal 5](#)
- [PUB-3105, Division ES&H Self-Assessment Manual](#)

Institutional and divisional safety and health performance goals and objectives are directly achieved through the application of the seven ISMS principles and implementation of the five ISMS core functions at each level of organization at Berkeley Lab: at the institutional level, at the division or department level, and at the individual project or work activity level.

References:

- [ISMS Management Plan, Section 6.1 \(ES&H Management System Mechanisms\), Introduction](#)
- [PUB-3105, Division ES&H Self-Assessment Manual, 3.0 Division Self-Assessment](#)

Division ES&H implementation plans describe in detail how work is reviewed and authorized at the activity or project level to determine and assure line management, supervisory, and employee safety responsibilities are identified and implemented; they also address qualifications and training, as well as engineering and procedural requirements.

References:

- [ISMS Management Plan, Section 4.5, Institution and Division ISMS Interface](#)

4.2 Qualified Worker Safety and Health Staff

Berkeley Lab strives to hire and retain qualified worker protection staff to direct and manage the worker safety and health program. LBNL has established specific skill requirements for every level of Health and Safety Professionals to ensure that each hired applicant possesses the qualifications necessary to effectively perform the duties of his/her position.

The Berkeley Lab WSHP is managed and directed by the Worker Safety and Health Department Head, a Certified Industrial Hygienist (CIH) or equivalent, in accordance with Section 851.20(a)(2).

References:

- [RPM, HR Position Descriptions](#)

4.3 Accountability

The Laboratory Director has the ultimate responsibility for safety at Berkeley Lab, and in particular, for the establishment and administration of environment, health, and safety policies that meet the DOE requirements.

The Laboratory Director has delegated to all levels of management the authority to implement Berkeley Lab's health, safety, and emergency-preparedness policies.

Reference:

- [RPM, ES&H Core Policy, E. Roles and Responsibilities](#)

Line management is responsible and accountable for the protection of the public, the workers, and the environment. More specifically, Laboratory line managers are responsible for integrating ES&H into work activities and for ensuring active, rigorous communication up and down the management line with the workforce.

References:

- [RPM, ES&H Core Policy, E. Roles and Responsibilities](#)
- [ISMS Management Plan, Section 6.2.1, ISMS Guiding Principle 1—Line Management Responsibility for Safety](#)
- [RPM, HR Position Descriptions](#)
- [RPM, Employee Performance Evaluations](#)

To ensure that Program responsibilities are assigned and that workers are held accountable for safety and health performance, managers and supervisors are required to:

- Ensure that the Laboratory's environment, health, and safety policies are being observed within their divisions. They are also responsible for adhering to the five core functions of the Laboratory's ISM plan.
- Ensure that all workers reporting to him or her understand the ES&H expectations, governing work controls, and the means by which they can safely and successfully perform their assignments.
- Specify each divisional safety and health goals.
- Ensure that all employees' performance expectations include specific ES&H criteria.
- Appropriately define and manage safety and health issues.
- Provide the necessary resources required to accomplish safety and health objectives.
- Monitor work to ensure compliance.
- Measure and evaluate performance against targets when applicable.
- Reward workers for good safety and health performance.

References:

- [RPM, ES&H Core Policy, E. Roles and Responsibilities](#)

- [RPM, Section 2.05\(A\)\(1\)](#)
- [RPM, Employee Performance Evaluations](#)

Additionally, for all work activities, line management is responsible for ensuring that workers, including affiliates and students, have the skills, knowledge, and abilities, including physical capabilities, to perform their work assignments.

References:

- ISMS Management Plan, Section 6.2.3, ISMS Guiding Principle 3—Competence Commensurate with Responsibilities
- [RPM, ES&H Core Policy, E. Roles and Responsibilities](#)
- PUB-3111 (QAPD), [Section 1 \(Organization\), Subsection 1.4 \(Staff Proficiency\)](#)
- [RPM, Chapter 2, Sections 2.04\(E\)\(1\)\(b\)](#)
- RPM, Chapter 1, Sections [1.06\(A\)\(1\)\(c\)](#) and [\(B\)\(3\)\(e\)](#)
- [ES&H Manual Chapter 24, Work Process A. General Requirements and Information](#)

Berkeley Lab routinely evaluates work performance and the workplace to identify, correct, and prevent problems that may hinder the organization in achieving its scientific and operational objectives. Some of these assessments are required under the terms of the DOE/LBNL Contract between the University and DOE. Assessments can also confirm that objectives and goals are being met. Such assessments include:

- Management Assessments
- Divisional ES&H Self-Assessments
- Peer Reviews
- Independent Assessments
- Corrective Action Review

References:

- [RPM, Quality Assurance Policy](#)
- [PUB-3111 \(QAPD\), Section 2.0 Quality Improvement](#)

The principal means of establishing and enforcing accountability for safety and health are:

- Communicating safety and health expectations to workers
- Reinforcing expectations through timely verbal feedback

- Conducting formal appraisals and implementing salary actions annually for each employee
- Providing awards and recognition for notable contributions to safety and health and taking corrective action in cases of worker misconduct
- Assessing safety and health performance in the employee performance appraisal, including expectations and accomplishments. For managers and supervisors, the performance appraisal includes an assessment of safety and health processes

References:

- [RPM, ES&H Core Policy, E. Roles and Responsibilities](#)
- [RPM, Employee Performance Evaluations](#)
- [RPM, Section 2.05\(C\)\(1\)](#)

4.4 Worker Involvement

Worker involvement in safety and health is essential to the success of LBNL's ISMS and WSHP. Workers are encouraged to identify safety and health concerns and to propose solutions; involvement is actively sought throughout the work review, authorization, and execution process. Line Management must ensure that workers are given the opportunity to participate in the identification and analysis of hazards and the determination of appropriate work controls for work activities.

References:

- [ISMS Management Plan, Section 6.2.1.2 Workers Are Responsible for Participating in the Development of the ES&H System and for working according to established Laboratory processes/procedures as Guided by the Expectations, Roles, and Responsibilities Assigned to Them by Line Management](#)
- [RPM, Workers' ES&H Rights & Responsibilities](#)
- [ES&H Manual, Chapter 6, Section 6.5](#)
- [PUB-3105, Division ES&H Self-Assessment Manual](#)

Worker involvement is promoted through:

- Participation on Divisional Safety Committees and Safety Advisory Committee Subcommittees (such as the Traffic and Pedestrian Safety)
- Participation on accident review teams
- "All hands" safety meetings

- Safety Spot Awards program
- EHS Division online suggestion box and e-mail address dedicated to safety concern programs
- Division-level feedback programs
- LBNL newsletters and Web sites
- Participation in Divisional Self-Assessments
- Participation in the Safety Walk-Around Program
- Pre-start or tailgate meetings, etc.
- Lessons Learned Database

References:

- [RPM, ES&H Core Policy, E. Roles and Responsibilities](#)
- Divisional Safety Committee Charters (see Safety Committee Web page of a specific division)
- [LBNL Safety Advisory Committee \(SAC\), Subcommittee Charters](#)
- [EHS Web page, References, Safety Concerns](#)
- [PUB-5344 \(Environment Safety and Health Self Assessment Program\), Chapter 6](#)
- [PUB-3105, Division ES&H Self-Assessment Manual](#)
- [LBNL/PUB-5519 \(4\), Lessons Learned and Best Practices Program Manual](#)

4.5 Access to Information

Safety and health documents that contain the information needed to perform work safely are readily available via the Berkeley Lab Web site or at the work site for all workers who need access to the information. Safety and health documents are written so that they are readily understandable by the individuals performing and managing the work.

All work, including work by affiliates, students, contract labor, construction contractors and other service contractors is to be performed in conformance with work instructions, including signs, work authorizations, work permits, posted procedures, and other work-authorizing documents. If the work instructions cannot be followed safely as presented, or if they present a new hazard, the worker is responsible for notifying the appropriate individuals and assisting, as appropriate, with modifying the work instruction. The work supervisor is responsible for ensuring that each worker involved in a work activity has been trained in, and has immediate access to, the work activity's applicable procedures and governing documents.

References:

- [PUB-3111, QAPD, Section 3, Document and Records Management](#)
- [PUB-3111, QAPD, Section 4, Work Processes](#)
- [ISMS Management Plan, Section 6.2.2, ISMS Guiding Principle 2—Clear Roles and Responsibilities](#)
- [ISMS Management Plan, Section 6.2.2.3, LBNL's Commitment to Safety and Stewardship of the Environment through ISM Is Extended to Subcontractors and Subcontract Employees for Whom LBNL Has ES&H Responsibility by Describing Clear Roles and Responsibilities](#)

Workers have access to information that is related to the Program and to the performance measurement of safety and health.

References:

- [RPM, Workers' ES&H Rights & Responsibilities](#)
- [ISMS Management Plan, Section 9.2, Performance Objectives and Performance Measures](#)
- [Office of Contract Assurance \(OCA\) Web page, Contract Measures](#)
- [OCA Webpage, ES&H Assurance, Annual ES&H Self-Assessment Reports](#)

4.6 Reporting Incidents and Hazards

Berkeley Lab has established procedures for workers to report, without reprisal, job-related injuries, illnesses, fatalities, incidents, and hazards, and to make recommendations about appropriate ways to control the hazards.

Employees may file a concern directly with their division director, department head, immediate supervisor or work lead, principal investigator or division safety coordinator, as well as seek assistance from OCA, ES&H Liaison, or DOE. Persons reporting hazards or improper activities are fully protected by the law and Laboratory policy against retaliation.

Federal law prohibits LBNL from making reprisals against workers who raise safety concerns. Under 10 CFR 708, Contractor Employee Protection Program, employees of DOE contractors have the right to file (confidential or not) complaints with DOE. This may be done through the local DOE office or through a DOE Employee Concerns Program hotline within 90 days. It includes, but is not limited to, issues regarding safety and health. Workers may also file a complaint with the DOE Inspector General.

Workers also have access to UC whistleblower procedures for reporting events and hazards.

References:

- [ISMS Management Plan, Section 6.7.1.1, Work Activities Are Monitored](#)
- [RPM, Employee ES&H Concerns Reporting Policy](#)
- [LBNL Safety Concerns Web Page](#) and [E-Mail](#) Address
- [LBNL Research & Institutional Integrity Office: Employee Concerns](#)

4.7 EHS Suggestion Box Responding to Reports

Reports of incidents or recommendations are responded to promptly.

Workers are responsible for bringing safety and health concerns promptly to the attention of the appropriate manager or supervisor for resolution. Line management is then responsible for investigating the concern and implementing corrective action. If a satisfactory response is not received, the senior manager for the organization should be contacted, followed by the Environment, Health, and Safety Division.

Reference:

- [RPM, Employee ES&H Concerns Reporting Policy](#)

4.8 Safety & Health Communications

Communication is a key element in ensuring that the Berkeley Lab ES&H goals and health and safety requirements are met. The Laboratory has an established, comprehensive ES&H Communications Program that includes training all workers. Communication goals include creating ISMS awareness and sensitizing workers to safety and health issues, using Laboratory-wide communications and tailored training.

Divisions employ several methodologies to ensure that ES&H communication is a two-way exchange between management and staff. The most common form of communication is the division safety committee, but management frequently communicates about ES&H with staff through other means as well. Some examples are holding town-hall or all-hands meetings that include safety on the agendas; including safety on the agendas of regular senior management meetings; and group meetings.

Safety and health communications are accomplished through the [EHS Division Web site](#), Today at Berkeley Lab (TABL) articles, Divisional EH&S Web pages, and Divisional newsletters and automatic dissemination of lessons learned and best practices via the Lessons Learned database.

Part of the LBNL ES&H philosophy is that supervisors are expected to ensure that all workers reporting to them, including affiliates and students, understand the expectations related to safety and health, the governing work controls, and the means by which workers can safely and successfully perform their assignments.

References:

- [ISMS Management Plan, Section 6.2.1.2, Workers Are Responsible for Participating in the Development of the ES&H System and for working according to established Laboratory processes/procedures as Guided by the Expectations, Roles, and Responsibilities Assigned to Them by Line Management](#)
- [ISMS Management Plan, Section 8.7, Communications and Training](#)
- [PUB-3111, QAPD, LBNL Quality Assurance Program Description](#)
- [RPM, ES&H Core Policy, D.3.f](#)
- [ES&H Manual, Chapter 1, Section 1.6.2.b](#)
- [ES&H Manual, Chapter 32, Job Hazards Analysis](#)
- [OIA, OCA, Assurance and Reporting Databases, Lessons Learned Database](#)
(password required)

Additionally, divisional and line management review deficiencies and issues in operations and facilities identified in self-assessments, audits, reviews, appraisals, and occurrence reports, and determine appropriate corrective actions. The goals of this process are to improve safety in the workplace, maintain compliance with safety and health requirements, prevent recurrences, and reduce risk. From these reviews comes a steady flow of communications designed to keep workers informed and foster an atmosphere in which safety is a routine part of work. Many communication tools and approaches are used to engage workers at all levels, including campaigns to promote awareness of safety and health concerns such as eye protection, machine safeguarding, and bicycle safety; promotion of the ES&H Manual; and safety and health communications guidance for supervisors, such as the ["1 Minute 4 Safety"](#) program.

Lessons learned are shared to improve operational safety by benefiting from the experience of others. Lessons learned are prepared and distributed whenever there is an opportunity to share a valuable new work practice or warn others of an adverse practice, experience, or product. The lessons-learned process is an integral part of every safety, health, and environment program at Berkeley Lab. It is the intent of the Laboratory to correct, on as broad a basis as possible, any problems that may arise.

The lessons-learned program ensures that incidents, near misses, and other events at Berkeley Lab are identified and translated into corrective actions that improve safety performance and prevent recurrence. The Program addresses safe practices as well as practices leading to events or accidents; it also formalizes the communication process and ensures consistent distribution of lessons learned to Laboratory staff and the DOE community.

References:

- [PUB-3111, QAPD, Section 2 \(Quality Improvement\), Subsection 2.3 \(Continuous Improvement\), Part 2.3.2 \(Lessons Learned\)](#)
- [PUB-5520/UC Assurance Plan for LBNL, Section 3.2](#)

4.9 Stop Work Authority

Every new employee is informed upon being hired that he or she is empowered to stop work in case of imminent danger. Prompt notification of the employee's immediate supervisor is required. Resumption of work will not proceed until after the condition has been evaluated and appropriate remedial actions have been taken.

All Berkeley Lab employees, contractors, and affiliates are responsible for stopping work activities considered to be an imminent danger. Stopping unsafe work applies to all activities conducted at the Laboratory and to all off-site facilities operated by Laboratory personnel. An "imminent danger" is defined as any condition or practice that could reasonably be expected to cause death or serious injury, or environmental harm. Whenever an employee, contractor, or affiliate encounters conditions or practices that appear to constitute an imminent danger, such individuals have the authority and responsibility to:

- Alert the affected employee(s) engaged in the unsafe work creating an imminent danger condition, and request that the work be stopped.
- Notify the immediate supervisor and/or responsible division/department manager (if known).
- Call Berkeley Lab's emergency telephone number (x7911) and report the incident. The Laboratory's 24/7 Emergency Notification/Contact Team will also be notified through this contact.

The Berkeley Lab 24/7 Emergency Notification/Contact Team at (510) 486-6999 will ensure that the supervisor is notified and will assist the supervisor in preparing a report to the EHS Division Director, describing the unsafe activity and identifying corrective actions and responsibilities.

References:

- [RPM, Stop Work Policy](#)
- [ISMS Management Plan, Section 6.7.1.1, Work Activities Are Monitored](#)

4.10 Informing Workers of Rights

Workers have the right to work in an environment free from recognized hazards likely to cause serious injury or death. Therefore, Berkeley Lab will inform workers of their rights by appropriate means, e.g., EH&S classes, communications literature, and the Worker Protection for DOE Contractor Employees poster.

References:

- [RPM, Workers' ES&H Rights and Responsibilities](#)
- [DOE-designated Worker Protection Poster](#)

4.11 Budgeting For Safety

ES&H is a primary consideration in planning and executing all Berkeley Lab work activities. Management is responsible for prioritizing and allocating resources adequately to ensure that ISMS requirements for working safely can be fulfilled. Ensuring that appropriate resources for ES&H are allocated in program and budget plans and for the implementation of all phases of facility and work-activity processes is critical to making the ISMS operable and sustainable.

Divisions and responsible research staff and program leads are responsible for ensuring their specific operations and equipment are safe and environmentally sound using their resources.

If an urgent life safety or environmental issue is identified with the Laboratory's facilities or infrastructure, the Laboratory provides a list of responsible contacts who can provide prompt response and action.

If the identified institutional issue is not an immediate urgent action requirement, the Laboratory invites entry of the issue into the Corrective Action Tracking System (CATS) where it can be assessed and prioritized by the CATS team (and funded if a high CATS

priority). Each year the CATS team is provided an allocation of funds through the UniCall process (see below) to address their high priority institutional facilities and infrastructure items

Divisions are also invited to raise any institutional facilities and infrastructure issue directly through the Laboratory's annual UniCall project identification, prioritization and funding process. In this annual process, all program and operations Divisions are asked to consider the mission readiness of the institutional facilities and infrastructure they depend upon, and to identify their highest priority project(s) for maintenance, alterations and upgrades needed to support the performance of their missions, including any facilities work needed to ensure it can be performed in a safe and environmentally sound manner.

Reference:

- [RPM, Unified Project Call Process \(Unicall\)](#)
- [ISMS Management Plan, Section 6.3.2.1 \(Resource Planning Processes Ensure Balanced Priorities\)](#)

5. Workers' Rights

The workers' rights listed in this section are implemented by the ES&H Manual and other safety documents (such as the Chemical Hygiene Safety Plan), and communicated by the Worker Protection for DOE Contractor Employees poster.

References:

- [RPM, Workers' ES&H Rights and Responsibilities](#)
- [DOE-designated Worker Protection Poster](#)
-

5.1 Participating in Safety Activities on Official Time

Workers have the right to participate in activities related to the Program on official time, including exercising all workers' rights listed in the following Sections 5.2 through 5.8 of this document.

Reference:

- [RPM, Workers' ES&H Rights and Responsibilities](#)

5.2 Access to Information

Workers have the right to have access to:

- DOE safety and health publications.
- Documents describing the LBNL Safety and Health Program such as this Worker Safety and Health Program and the ISMS.
- Safety and health standards, controls, and procedures applicable to LBNL, as identified in such documents as the ES&H MANUAL and the Chemical Hygiene Safety Plan.
- Worker Protection for DOE Contractor Employees poster that informs workers of their rights and responsibilities.
- Results of inspections and accident investigations.
- Limited information on any recordkeeping log (OSHA Form 300) with access subject to Freedom of Information Act requirements and restrictions.
- DOE Form 5484.3 (DOE equivalent of OSHA Form 301) that contains the employees name as the injured or ill worker.

References:

- [RPM, Workers' ES&H Rights and Responsibilities](#)
- [DOE-designated Worker Protection Poster](#)

5.3 Notification of Monitoring Results

Workers have the right to be notified when monitoring results indicate they have been overexposed to hazardous materials.

Written notification of monitoring results is provided by the industrial hygienist conducting the exposure monitoring to the employee (and employee's supervisor) in accordance with the specific OSHA requirements for that substance. Where no criterion exists, monitoring results will be provided within 15 days of receiving analytical results from the laboratory performing the analyses.

References:

- [RPM, Workers' ES&H Rights and Responsibilities](#)
- [Chemical Hygiene & Safety Plan](#)
- [ES&H Manual, Chapter 4, Exposure Assessment](#)

5.4 Observation of Monitoring

Workers have the right to observe exposure monitoring or measurement of hazardous agents and to be provided with the results of their own exposure monitoring. When personnel exposure monitoring is conducted on individuals, the monitored employee and their supervisor receive a copy of the exposure assessment.

References:

- [RPM, Workers' ES&H Rights and Responsibilities](#)
- [ES&H Manual, Chapter 4, Exposure Assessment](#)

5.5 Inspections

Workers have the right to a representative authorized by workers to accompany the DOE Director or his or her authorized representative during the physical inspection of the workplace for the purpose of aiding the inspection. When no authorized worker representative is available, the Director or authorized representative must consult, as appropriate, with workers on matters of worker safety and health.

Reference:

- [RPM, Workers' ES&H Rights and Responsibilities](#)

5.6 Workers' Concerns

Workers have the right to express their concerns related to worker safety and health.

Berkeley Lab has established procedures for workers to report, without reprisal, job-related injuries, illnesses, fatalities, incidents, and hazards, and to make recommendations about appropriate ways to control those hazards.

Workers have access to UC whistleblower procedures, which provide a process for reporting events and hazards (<http://www.ucop.edu/uc-whistleblower/>).

Federal law prohibits Berkeley Lab from making reprisals against workers who raise safety concerns. Employees of DOE contractors have the right to file confidential complaints with the local DOE office within 60 days regarding safety and health issues or reprisals, in accordance with 10 CFR 708. Workers may file a complaint with the [DOE Employee ES&H Concerns Program](#).

Workers who believe they are being denied the rights described in Section 5 of this document, or believe they are being subjected to reprisals for attempting to exercise those rights, may file a concern following the procedure described in [DOE Order 442.1A, DOE Employee ES&H Concerns Program](#).

References:

- [ISMS Management Plan, Section 6.7.1.1 \(Work Activities Are Monitored\)](#)
- [RPM, Employee ES&H Concerns Reporting Policy](#)
- [RPM Section 2.05 \(K\)\(II\)\(B\)](#)
- [LBNL Safety Concerns Web Page](#) & [E-Mail](#) Address
- [LBNL Internal Whistleblower Hotline](#)
- [EH&S Suggestion Box](#)

5.7 Refusal to Work

Workers have the right to decline to perform an assigned task because of a reasonable belief that the task poses an imminent risk of serious physical harm or death, coupled with a reasonable belief that there is insufficient time to seek effective redress through normal hazard reporting and abatement procedures.

References:

- [RPM, Stop Work Policy](#)

5.8 Stop Work Authority

All workers are empowered to stop work if there is an imminent danger condition. Prompt notification of the immediate supervisor is required. Resumption of work will not proceed until after the condition has been evaluated and the appropriate remedial actions have been taken.

References:

- [RPM, Stop Work Policy](#)
- [EH&S Web page, References, Stop Work Policy](#)
- [ISMS Management Plan, Section 6.7.1.1 \(Work Activities Are Monitored\)](#)

6. Worker Responsibilities

6.1 Safety

Every worker is directly responsible for ensuring his or her own safety and for promoting a safe and healthful workplace and community.

All workers are to follow ES&H-related work instructions. If work instructions cannot be followed safely as presented, or if they present a new hazard, workers are responsible for notifying the appropriate individuals and assisting, as appropriate, with modifying the work instructions.

Every worker is responsible for (1) understanding and participating in the Berkeley Lab ES&H goal (see [Section 4.1](#)), (2) determining with others the best way to achieve the ES&H goal in conformance with LBNL requirements, (3) using appropriate resources at his or her disposal, and (4) asking for any help necessary to ensure a safe work environment and reduce environmental impact, while performing the broader set of job responsibilities and pursuing assistance from technical, administrative, or craft services.

References:

- [RPM, Workers' ES&H Rights and Responsibilities](#)
- [ES&H Manual, Chapter 1, General ES&H Requirements, Responsibilities and Work Practices](#)

6.2 Reporting Hazards

Every worker is responsible for bringing existing or previously unrecognized hazardous conditions and opportunities for improvement to the attention of his or her immediate supervisor. The supervisor is responsible for evaluating the reports and for taking the appropriate action.

References:

- [RPM, Workers' ES&H Rights and Responsibilities](#)
- [ES&H Manual, Chapter 1, General ES&H Requirements, Responsibilities and Work Practices](#)

6.3 Reporting Injuries and Illnesses

Workers who are injured or become ill as a result of a work-related activity or accident are required to notify the work supervisor immediately and obtain appropriate transport to Health Services. In severe instances it may be appropriate to request emergency transport by calling x7911.

References:

- [ES&H Manual, Chapter 5, Injury Response and Review](#)

7. Hazard Identification and Assessment

Work conducted at Berkeley Lab involves a variety of safety hazards. LBNL manages these hazards using the Integrated Safety Management System (ISMS) and by promoting safe behavior at all work levels.

Line managers implement an integrated safety management process to ensure that safety-related work issues have been addressed comprehensively. Managers follow the requirements in RPM, Hazard Analysis & Work Authorization Policy and Overview, to identify hazards and implement appropriate controls. Berkeley Lab's EHS Division and divisional ES&H personnel provide support and guidance to line managers for identifying and mitigating the hazards in their workplaces.

Line managers perform the following safety functions in support of hazard-control efforts:

- Define the scope of work
- Analyze the hazards
- Develop and implement controls
- Perform work within the controls
- Provide feedback and continuous improvement

Reference:

- [ISMS Management Plan, Section 6.4.1.1 \(Hazards and Environmental Aspects Are Identified and Analyzed for All Work Activities\)](#)
- [RPM, Hazard Analysis & Work Authorization Policy and Overview](#)
- [ES&H Manual, Chapter 6, Work Process A.1, Work Planning: Completion of the Job Hazards Analysis](#)

7.1 Identifying Workplace Hazards and Assessing Risk

The identification and analysis of workplace hazards is part of the work planning process. The goal of this process is to ensure that the hazards associated with work activities and area operations are clearly understood and appropriately managed.

All new work activities, changes to existing work, or the introduction of new equipment, materials (e.g. chemicals) or processes (which introduce new hazards or increase the hazard level) need to be reviewed to analyze hazards, identify safety standards/requirements, and establish appropriate controls. Safety conditions and requirements need to be formally established and in place before work is initiated.

References:

- [ES&H Manual, Chapter 1, Sections 1.6.5 and 1.6.6](#)

7.2 Workers' Exposure Assessment

Berkeley Lab has a program to assess workers' exposure to chemical, physical, biological, or safety workplace hazards through appropriate workplace monitoring, including industrial hygiene exposure assessments and the ES&H Self-Assessment Program.

Exposure assessment is an evaluation process performed by EHS industrial hygienists and other experts (such as specially trained contractor representatives) to determine the risk to workers from personnel exposure to hazardous chemical, biological, or physical agents and the adequacy of hazard controls. Results of exposure assessments may be used to validate or improve hazard controls, extend the same controls to other employees who are similarly exposed, provide employees with appropriate medical tests and examinations (i.e., medical surveillance) to monitor employee health, and demonstrate compliance with regulations.

Exposure assessments are conducted as one component of most ES&H programs presented in the ES&H Manual, and lower tier subcontractor programs, that involve potential personnel exposure to hazardous agents or conditions. They may include qualitative or quantitative evaluations of risk. Qualitative exposure assessments involve a professional judgment of risk. These assessments may be conducted when the hazardous agent cannot be practically measured or when agents are controlled in an engineered system. Quantitative exposure assessments involve measurement (i.e., sampling, surveying, or monitoring) of exposure levels. These assessments may be conducted when the identity of the hazardous agents present can be reasonably

determined and sampled for, and if there is insufficient information on the extent of potential exposure or measurement of the exposure level that is required by regulation (e.g., OSHA) or if required by construction subcontract documents.

Quantitative exposure assessment results are compared to occupational exposure limits such as OSHA Permissible Exposure Limits (PELs) and ACGIH Threshold Limit Values (TLVs), whichever is lower. Employee exposures are minimized and maintained below required exposure limits. Appropriate controls are implemented when required action levels are reached.

References:

- [ES&H Manual, Chapter 45, CHSP, Exposure Assessments](#)
- [ES&H Manual, Chapter 4, Exposure Assessment, Work Process A. General Requirements](#)

Berkeley Lab's ES&H Self-Assessment Program is a formal, internal process used to evaluate ES&H programs, policies, and processes. The process is designed to ensure that Laboratory work is conducted safely and with minimal adverse effects to workers (employees, affiliates, and subcontractors). The Self-Assessment Program is also the mechanism used to institute continuous improvements to ES&H programs.

The Self-Assessment Program generates targeted performance data through evaluations conducted at all levels (individual workers, operations, facilities, departments, and divisions) of the organization. The data is analyzed against regulatory and contractual requirements to identify ES&H strengths, weaknesses, and opportunities for improvement. Findings are communicated to appropriate line organizations and staff, and corrective actions are implemented and tracked. The program consists of the following core activities:

- Establishment of performance objectives and criteria;
- Assessments and appraisals;
- Development and tracking of actions to correct deficiencies and/or sustain improvements; and
- Reporting self-assessment results and improvements to the LBNL community.

References:

- [EHS Assurance Manual](#)

7.3 Documenting & Recording Workplace Assessments

Assessments for chemical, physical, biological, and safety workplace hazards are documented following recognized exposure assessment and testing methodologies and using accredited and certified laboratories where appropriate.

Exposure monitoring results are recorded with documentation that describes the tasks and locations where monitoring occurred, and identifies:

- Workers monitored or represented by the monitoring
- Sampling methods and durations
- Control measures in place during monitoring (including use of personal protective equipment)
- Job task and location
- Any other factors that may have affected sampling results

Quality assurance records are maintained and retrievable for the monitoring equipment used.

Reference:

- [ES&H Manual, Chapter 4, Exposure Assessment](#)

To facilitate the development, tracking, and close out of corrective actions identified during ES&H self-assessments, a computerized database called the Corrective Action Tracking System (CATS) is used. The CATS database documents and tracks the following information:

- Identification of the assessment, type, and date;
- Description of each finding to be corrected, including location;
- Description of the interim measures taken to protect workers;
- Description of the corrective action task(s) for each finding;
- Identification of the responsible person with the authority to complete each task;
- Schedule, including applicable milestones, for the completion of each task; and
- The person accountable for implementation and closeout of the corrective actions for the particular assessment. This individual, referred to as the "approver," must have the authority to bring about the necessary improvements and is typically a senior division manager, a division safety coordinator, or an EHS functional manager.

References:

- [EHS Assurance Manual](#)

7.4 New Construction and Facilities Modifications Design Review

New construction projects and facilities modifications are reviewed for hazards and risks, and to ensure that appropriate ES&H requirements are integrated into the planned project or facility. ES&H requirements identified through this process are incorporated into the project's design. EHS Division participation in this process is covered by an MOU between the EHS and Facilities Divisions.

EHS Division professionals are assigned review and concurrence authority in all four phases of project design: conceptual design, preliminary design, final design, and construction inspection.

The level of formality and complexity of the design review process is directly related to the size and complexity of the project. As the hazards and risks associated with a new facility design or modification increase, the formality, documentation, and general level of effort increase.

References:

- [ISMS Management Plan, Section 6.3.1.2 \(The Graded Approach Process Is Consistently Applied\)](#)
- [Design and Construction Procedures Manual \(Rev 3, 11/26/2013\)](#)

7.5 Evaluating Operations, Procedures, and Facilities

The ISMS Description and subordinate documents, including the ES&H Manual, emphasize how to conduct work at the work-activity level. In a research and development organization such as Berkeley Lab, the focus is on the identification of hazards associated with individual work activities, because these activities can change frequently and thus present different hazards.

At LBNL, hazard identification is accomplished:

- On a routine/ongoing basis;
- During regularly scheduled assessment activities; and
- As an integral component of the work authorization process.

Examples of routine/ongoing hazard identification include daily or pre-use inspections of:

- Ladders
- Hand and power tools
- Condition of electrical equipment
- Manually handling load pre-lifts
- Hoist, crane, and accessory equipment
- Personal fall protective equipment
- Scaffolds
- Open trenches
- Extendable boom or other elevating work platforms
- Forklifts
- Active construction projects
- Occupancies for fire safety, including hot-work permits

References:

- [ES&H Manual, Chapter 35, Elevated Work--Aerial Work Platforms, Ladders and Scaffolds](#)
- [ES&H Manual Chapter 25, Machine Safeguarding--Shop and Laboratory Machine Safety](#)
- [ES&H Manual, Chapter 8, Section 8.13 Electrical Safety Considerations](#)
- [ES&H Manual, Chapter 27, Cranes, Hoists, and Rigging Safety](#)
- [ES&H Manual, Chapter 10, Construction Health & Safety](#)
- [ES&H Manual, Chapter 12, Fire Prevention and Protection](#)

Self-assessment programs are regularly scheduled hazard identification activities that establish a formal, internal process used to evaluate ES&H programs, policies, and processes. Self-assessment activities are also the mechanism used to institute continuous improvements to the Laboratory's ES&H programs. Examples of such regularly scheduled hazard identification activities include:

- Line Management Safety Walk-Around Program
- Divisional Self-Assessments
- ES&H Program Self-Assessments
- Environment, Safety, and Health management Peer reviews

References:

- [EH&S Web page, References, Safety Walk-Around Checklist For Managers](#)
- [OCA, Assurance Systems, ES&H Assurance](#)
- [EHS Assurance Manual](#)
- [ES&H Manual, Chapter 1, Sections 1.6, 1.c. Line Management Responsibility and Accountability for ES&H](#)

Other regularly scheduled hazard identification activities include:

- Annual fire safety inspection
- Quarterly hoist, crane, and accessory equipment inspection
- Idle crane pre-use inspection
- Nondestructive crack detection examination of crane or hoist hooks greater than 3 ton and all lifting fixtures with welds
- Annual running rope inspection
- Lifting device & fixture inspection & testing
- Annual LOTO program audit

7.6 Activity Hazard Analysis & Work Authorization

Berkeley Lab's Hazard Analysis & Work Authorization Policy ensures that all work is performed in a safe manner by:

- Ensuring that work planning is performed prior to starting work
- Defining the work scope, analyzing associated hazards, and developing controls such that hazards are identified and mitigated
- Providing work authorization processes to ensure that procedures, controls, and resources are in place. These processes may include:
 - Job Hazards Analysis (JHA) for routine work done by workers and affiliates
 - Task-based Job Hazard Analysis for unpredictable, short-term, or unusual work done by workers and affiliates
 - Subcontractor Job Hazards Analysis (sJHA)
 - Construction subcontractors' ES&H submittal package (Construction JHA)
 - Activity Hazard Documents (AHDs) for higher-hazard work
 - Temporary Work Authorization (TWA)
 - Biosafety Work Authorization
 - Radiological Work Authorization (RWA)
 - Facility Work Authorization
- Ensuring that the process and authorizations are documented prior to starting work

Line Management Authorizations require principal investigators, managers, and supervisors to identify work hazards and implement appropriate controls during the work planning process. For most work, the hazards and risks are known and typical, and precautions are routine. Line management authorizations are based on individual

activities. Work leads must assure that employees know how to perform the work safely and in conformance with applicable requirements, and must provide on-the-job training as needed

Certain work activities pose elevated hazards that require a Formal Authorization. Depending on the hazard, the principal investigator, supervisor, or manager must document the work and associated hazards, describe administrative and engineering controls to mitigate those hazards, and document training or certification for the participants in a written document or plan. Formal authorizations are based on individual activities. Experts with appropriate certifications or background from within EH&S and other divisions are brought into the process for consultation, review, and/or approval.

Reference:

- [ES&H Manual, Chapter 6, Work Process A. Line Management Authorization for Routine or Special Hazards](#)

Facility-based authorizations described in Safety Analysis Documents provide safety "operating envelopes" based on the hazards and controls of activities taking place within that facility. A facility-based authorization is a function of some additional aggregate hazard or interaction between multiple operations, or else is a function of some piece of facility equipment. Operating divisions within the affected facility are responsible for conducting work within the defined safety "operating envelope" specified by the authorization. Once a facility-based authorization is in place, hazards and controls are reviewed periodically to ensure that the actual operations comply with the operating envelope established for that facility. In addition, existing programs and facilities must be reviewed periodically to determine if changes in operations may trigger a new facility-based authorization. The review and development of controls from the perspectives of facility design and facility procedures development are discussed in Section 8.1 below.

Reference:

- [ES&H Manual, Chapter 6, Work Process B. Facility-Based Authorizations](#)

A Job Hazard Analysis (JHA) program was implemented in FY 2008; since then, it has been continually improved in response to user feedback. In late 2014, this program will be superseded by the Work Planning and Control management system. The

Berkeley Lab JHA program, which is used to identify tasks, hazards, and controls associated with jobs at the activity level, is composed of the following elements:

1. Every worker must have a current Individual Baseline JHA, describing, analyzing, and authorizing regular and routine work that he/she performs. The authorized Individual Baseline JHA is obtained through the Individual Baseline JHA process described in ES&H Manual, [Chapter 32](#).
2. As necessary, every worker must have one or more current task-based JHA to describe, analyze, and authorize additional, unpredictable, short-term, or unusual work that is not included on the Individual Baseline JHA. The authorized task-based JHA can be obtained through:
 - a. Use of the task-based JHA process described in ES&H Manual, [Chapter 32](#), Job Hazard Analysis, or
 - b. Use of an equivalent task-based JHA process as described in a division's ISM Plan, and approved by the EH&S Division Director.
3. Work may not be conducted unless the applicable JHA(s) exist, except as noted below:

Exception: If a worker does not have a JHA authorizing the work, he/she may perform work that has been analyzed for someone else, provided that he/she is supervised by that person and that person has been authorized to perform the described work, and both adhere to the controls specified for that work. Work that is authorized by a formal authorization as defined in ES&H Manual, Chapter 6, may be subject to different requirements regarding untrained work. In that case, the requirements of the Formal Authorization prevail.

4. A worker must complete the JHA prior to beginning work, and review/update it at least annually from the date of authorization by the work lead, and as the job changes significantly.
5. The JHA must include all work that is more hazardous than that "Commonly Performed by the General Public."

The Job Hazards Analysis process consists of:

1. Identifying workers for whom an Individual Baseline JHA will be completed;
2. Identifying the scope of the work to which the JHA will apply;

3. Deciding whether a task-based JHA is needed in addition to the Individual Baseline JHA, and identifying to which workers it will apply;
4. Providing a comprehensive description of the work so that the hazards analysis can be viewed in context;
5. Collecting work-related data to enable identification of tasks, hazards, and controls;
6. Holding a JHA development work session between the worker and work lead to discuss and validate the identified tasks, hazards, and controls;
7. Capturing a final list of the tasks, hazards, and control information in a standard format; and
8. Signing the JHA form by the work lead and worker acknowledging concurrence on the tasks, hazards, and controls; as well as authorizing the work to proceed.

Reference:

- ES&H Manual, [Chapter 32](#), Job Hazard Analysis

7.7 Reviewing Safety and Health Experience

At Berkeley Lab, data and information regarding workplace accidents, injuries, and illnesses is collected by the EHS Division and analyzed to identify worker protection problem areas. In addition, OCA compiles data and information from the annual self-assessment activities and summarizes results in the Berkeley Lab Environment, Safety, and Health Self-Assessment Report. OCA analyzes self-assessment and NTS/PAAA results to identify repeated and related deficiencies as well as discernible trends to determine if generic root causes exist. Analysis techniques may include:

- Establishing correlation between deficiencies and circumstances that cause them;
- Predicting outcomes based on observation, experience, or reason;
- Looking at indicative signs and/or symptoms;
- Estimating future possibilities of recurrence.

When generic root causes exist, OCA and the EHS Division will develop corrective actions and lessons learned, as appropriate. The corrective actions are entered into CATS and tracked in the same manner as any assessment finding. Because most of the corrective actions at this level are institutional in nature, the objective of these actions is to foster continuous improvement of LBNL's ES&H performance.

Such analysis and trending is used to identify the prevalent types of accidents, injuries, and illnesses and their sources and causes. Information derived from trend analysis is used to focus worker protection efforts on the actual sources of injuries and illnesses and to help prioritize hazard abatement activities. Components of accident, injury, and illness data collection and analysis include:

- Procedures to investigate, find root causes, and report occupational injuries and illnesses and near misses;
- Systems and methods to collect, record, compile, and manage accident, injury, and illness data and information, including but not limited to the OSHA 300 log of occupational injuries and illnesses, workers' compensation data, accident reports, incident reports, industrial hygiene exposure monitoring results, inspection reports and CATS entries;
- Methodologies to analyze data and information to identify and trend accidents, injuries, and illnesses by type and source; and
- Use of the Tap Root™ root-cause analysis approach to analyze identified trends, to determine root causes, and to develop appropriate control measures.
- Use of the 5-Why analysis process

References:

- [PAAA Compliance Program Manual](#)
- [EHS Assurance Manual](#)
- [EH&S Division Web page, Accident Statistics](#)
- [ES&H Manual, Chapter 5, Work Process C. Procedure for Reviewing Work-Related Injury or Illness](#)
- PUB-5519 (1) Issues Management Program
- [PUB-3111, QAPD, Section 2.1, Management Assessment](#)
- [ES&H Manual, Chapter 15, Occurrence Reporting](#)

7.8 Interactions Between Workplace and Other Hazards

For the purpose of this document, workplace hazards are defined as physical, chemical, biological, and safety hazards with any potential to cause illness, injury, or death to a person. In instances where the requirements for other hazards (such as radiological hazards) overlap or appear to conflict, the personnel responsible for implementing worker protection and radiation protection requirements will coordinate their efforts. In such cases, the two sets of requirements are integrated and applied in a manner that

prevents undesirable results and provides reasonable assurance of adequate worker protection.

7.9 Closure Facility Hazards and Controls

A list of closure facility hazards and the established controls must be submitted to the Manager of the DOE-SC BSO within 90 days of identifying such hazards. This is accomplished by the Facilities Division and is part of the ongoing process they use to develop, operate, shut down, and transfer facilities, operations, and associated equipment in conformance with DOE Order 430.1B. Facility information required by this order is managed using the Facilities Information Management System (FIMS).

The Facilities Division, which is part of the Operations organization, manages Berkeley Lab's portion of the FIMS database. All real property capital asset data pertaining to buildings, site utilities, roads, walks, paved areas, fences site preparation, grading, and landscaping are recorded. Information regarding closure facilities, and their associated hazards and controls, is communicated between the Facilities Division and the DOE-SC BSO. Closure facilities are identified in the Annual Laboratory Plan. Specific plans for facility closure are identified in the Unified Project Call Process described in Section 1.27 of the RPM. An updated representative list of Closure Facilities is found in Appendix E.

Reference:

- [RPM, Unified Project Call Process \(UniCall\)](#)

8. Hazard Control and Abatement

Berkeley Lab has implemented a hazard prevention and abatement process to ensure that all identified and potential hazards are prevented or abated in a timely manner. Abatement actions are prioritized and implemented according to the risk to workers. Interim protective measures are implemented as appropriate, pending final abatement. Identified workplace hazards, interim protective measures, and CAPs are documented and tracked to closure through CATS.

Hazard controls are selected based on the following hierarchy:

- Elimination or substitution of the hazards where feasible and appropriate;
- Use of engineering controls where feasible and appropriate;

- Application of work practices and administrative controls that limit worker exposures; and
- Provision and use of personal protective equipment (PPE)

No work will be conducted at Berkeley Lab where there are recognized hazards until controls tailored to the work being performed are in place. Before each new project or significant change to any process (including introduction of new equipment) or work activity (including research) is commenced, the new project or change must be evaluated in conformance with the safe work authorization requirements of ES&H Manual, Chapter 6. The objective is to ensure that hazard controls enhance and further the nature of research and all other work activities, and not impede it. The Safety Analysis Document process is addressed in section 7.5 above.

References:

- [ES&H Manual, Chapter 1, Section 1.6, 6 Establishment of Hazard Controls](#)
- [ES&H Manual, Chapter 6, Safe Work Authorizations](#)

Safe Work Authorization is a review and management approval process designed to ensure that procedures, controls, and resources are in place before the work begins. All work at Berkeley Lab proceeds once it has been authorized. Work authorization classifications include the following:

- Job Hazard Analysis: The process that results in a worker hazard and control description (Hazards Profile) and Work Authorization document that includes: a description of the Work to which the JHA applies and descriptions of the tasks incorporated into that Work; the hazards associated with those tasks; the controls required to mitigate those hazards, using exposure assessment as necessary to evaluate exposures and controls; signatures of the Work Lead authorizing the Work; and the duration for which the work is authorized.
- Line Management: An implicit authorization provided by other documentation, or explicitly given but administered by the responsible division doing the work.
- Formal: A written document, concurrently authorized by the responsible division and by the EH&S Division, that describes the scope of work, required procedures and controls, authorized materials and equipment to be used, and staff authorized to conduct the work.
- Facility-based: Hazard analysis and controls are based on the facility as a whole rather than on an individual operation.

References:

- [RPM, Hazard Analysis & Work Authorization Policy and Overview](#)
- [ES&H Manual, Chapter 6, Safe Work Authorizations](#)
- [ES&H Manual, Chapter 32, Job Hazard Analysis](#)
- [PUB-3111 \(QAPD\), Sections 1.2 Grading Items and Services and Applying Management Controls, 1.3 Planning](#)

8.1 Development of Controls from the Perspectives of Facility Design and Facilities Procedures Development

Facility designs developed by engineering professionals are reviewed by other members of the project team and stakeholders. Safety and health professionals review designs for compliance with safety and health requirements. The number and rigor of design reviews vary depending on project size and complexity. Large construction projects have a design review at the conceptual design stage, preliminary design stage, final design stage, and construction stage.

Hazards that are identified in the design phase of new facilities and facility modifications or during the development or modification of procedures are eliminated or controlled through design or procedure changes. The controls implemented are commensurate with the risk level identified in the review process. Where hazards cannot be controlled through design changes, procedural or administrative controls or the use of PPE is considered.

References:

- [ISMS Management Plan, Section 6.3.1.2, The Graded Approach Process Is Consistently Applied.](#)
- [Memorandum of Understanding, "Interface Policy Between EH&S & Facilities: Project Support"](#)
- [ES&H Manual, Chapter 6, Work Process B. Facility-Based Authorizations](#)

8.2 Managing Identified Safety and Health Noncompliances

Identified safety and health noncompliant conditions, including *de minimis* violations, are managed through CATS, which provides a standardized method of tracking issues and deficiencies, documenting assessments, and prioritizing and tracking interim measures and final abatement actions.

A risk-assessment methodology, based on potential incident severity and probability of occurrence, is used to assess the relative risk of safety and health noncompliances tracked in CATS. The risk prioritization system uses a graded approach, which protects workers from higher levels of safety and health conditions by stopping work until corrective actions are applied.

Reference:

- [PUB-3111 \(QAPD\), Attachment B. Graded Approach Risk Methodology](#)
- [EHS Assurance Manual](#)
-

8.3 Purchasing Equipment, Products, and Services

The purchase of goods and services at Berkeley Lab is managed through the Laboratory Procurement Department, using the PeopleSoft/Oracle Financial Management System (FMS). The procurement of hazardous, controlled, and “special” materials (i.e., those products that pose unusual hazards, or present unusual problems in acquisition, handling, transportation, or internal control) is controlled through eProcurement (ePro) and its subset eBuy, which specifically identify high-hazard items ([Restricted Items List – Special Treatment Items](#)) for special EH&S review. These systems automatically route requisitions for these items to EH&S for review and approval before the requisition reaches Procurement.

Reference:

- [Berkeley Lab, Procurement & Property Management—Restricted Items](#)

Additionally, “General Provision Contracts”, “Facilities Division Standard Project Specifications”, and ES&H Manual, Chapter 10, are used to convey EH&S requirements to subcontractors who provide construction, equipment installation, and industrial services (e.g., repair, calibration, testing, road paving, and tree removal).

References:

- [Berkeley Lab Procurement, Forms Menu, General Provisions](#)
- [LBNL Facilities Master Specifications, ES&H Procedures, Section 013529](#)
- [ES&H Manual, Chapter 10, Sections 10.7 Required Work Processes](#)

Prior to proceeding with any service contractor or vendor work activity, the Berkeley Lab contact person (manager, supervisor, work lead) and service contractor or vendor are responsible for identifying hazards and implementing controls.

Reference:

- [ES&H Manual, Chapter 31, sJHA Process--Subcontractor Job Hazard Analysis](#)

9. Safety and Health Standards

The Rule requires Berkeley Lab to comply with a defined set of safety and health standards it has determined to be applicable to Laboratory workplaces. The standards are:

- 10 CFR 850 (Chronic Beryllium Disease Prevention Program)
- 29 CFR 1904.4 through 1904.11, 1904.29 through 1904.33; 1904.44; and 1904.46 (Recording and Reporting Occupational Injuries and Illnesses)
- 29 CFR 1910 (Occupational Safety and Health Standards), excluding 29 CFR 1910.1096 (Ionizing Radiation)
- 29 CFR 1926 (Safety and Health Regulations for Construction)
- American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" (2005)
- American National Standards Institute (ANSI) Z88.2, "American National Standard for Respiratory Protection" (1992)
- ANSI Z136.1, "Safe Use of Lasers" (2014). In late 2014 LBNL plans to adopt the 2014 edition of this standard. The year 2000 edition is referenced in the rule.
- ANSI Z49.1, "Safety in Welding, Cutting, and Allied Processes," Sections 4.3 and E4.3 (1999)
- National Fire Protection Association (NFPA) 70, "National Electrical Code" (2011). In 2014 LBNL adopted the 2011 edition of this standard to align with the current California Building Code. The year 2005 edition is referenced in the rule.

- NFPA 70E, "Standard for Electrical Safety in the Workplace" (2004). In early 2015 LBNL plans to adopt the 2012 edition of this standard. The year 2004 edition is referenced in the rule.
- American Society of Mechanical Engineers (ASME) Boilers and Pressure Vessel Code, section I through XII including applicable Code Cases (2004)
- ASME B31 (ASME Code for Pressure Piping), sections as required by 851.27(b)(8)(i) through (x)
- DOE Manual 231.1-1A, "Environment, Safety, and Health Reporting Manual" (September 9, 2004)

DOE and UC identify ES&H standards for adoption into the contract between the UC Regents of DOE (Contract 31) through the process described in the RPM. All standards required by the Rule that are applicable to Laboratory operations have been formally adopted into the ES&H standards set through this revision process.

References:

- [Requirements Management Policy](#), LBNL Requirements and Policies Manual

10. Training

The Berkeley Lab EH&S Training Program is a collaborative endeavor of the EHS Division and line management. The EHS Division provides training courses to meet regulatory and Laboratory requirements and applicable best practices. Line management provides On-the-Job Training (OJT) and training that is specific to the work conducted in its actual environment, and ensures that training requirements are met. The purpose of required EHS training is to help ensure that all LBNL personnel are aware of the hazards associated with their jobs and the methods for controlling those hazards; understand the health and safety effects of exposure to those hazards; and know how to perform operations safely and in accordance with required work practices, operating procedures, and applicable environmental protection requirements.

Reference:

- [ES&H Manual, Chapter 24 EHS Training Program, Work Process A. General Requirements and Information](#)

Training requirements originate from many sources, including: DOE orders, DOE regulations (10 CFR), OSHA regulations (29 CFR), EPA regulations (40 CFR), Department of Transportation regulations (49 CFR), the California Code of Regulations (Titles 8 and 22), LBNL's environmental permits, LBNL's Operating and Assurance Program, and LBNL policies and best practices. Training requirements are interpreted and promulgated to the individual employee through the ISM processes of defining work, analyzing hazards, identifying required controls, performing the work according to the controls, and providing feedback and continuous improvement.

Reference:

- [ES&H Manual, Chapter 24 EHS Training Program, Work Process A. General Requirements and Information](#)

Employees, affiliates, and visitors are responsible for completing pertinent ES&H training requirements based on the hazards, operations, and equipment expected to be encountered, and for applying information obtained from training opportunities to promote safe working conditions.

Reference:

- [ES&H Manual, Chapter 24. Section 24.5, Roles and Responsibilities](#)

The Berkeley Lab EH&S Training Database and the Human Resources Information System (HRIS) track and provide reports on EHS Training data. Some job-specific training and OJT are maintained in paper records. Individual staff and aggregate training reports, including training profiles and division training completion reports, are available through the [EHS Training Database](#). Individual staff can also use the [LBNL Onsite Data Warehouse \(BRS\)](#) to access a training report that includes all training that has been completed. In addition, training records can always be requested from EHS Training.

Reference:

- [ES&H Manual, Chapter 24, EHS Training Program, Work Process B. EHS Training Database](#)

11. Recordkeeping and Reporting

LBNL is responsible for establishing and maintaining recordkeeping and reporting processes for data related to worker health and safety including:

- Hazard inventories, assessments, and abatement
- Exposure measurements and controls
- Injuries and illnesses
- Safety and health deficiencies

It is specifically prohibited to conceal or destroy information concerning noncompliance or potential noncompliance with the requirements of this Program or the Rule.

Berkeley Lab uses a variety of methods to track safety and health data. For example, the Ergonomics Database tracks Ergo Evaluations across the Laboratory. It provides the ability to send e-mail to interested parties when an ergonomic evaluation has been completed. Chemical exposure measurements and assessments are maintained in the industrial hygiene database (CHESS Exposure Assessment Module) available through the Health and Safety Department. Material Safety Data Sheets (MSDS) are maintained in an electronic format to facilitate site-wide access. These databases may be password protected to manage appropriate access.

References:

- Comprehensive Health, Environment and Safety System Exposure Assessment Module (CHESS, password protected)
- [Chemical Management System \(CMS\)](#)
- [Ergonomics Database](#)

Injuries and illnesses at LBNL are tracked by the EHS Division. This information is reported to DOE in accordance with DOE Order 231.1-1B, dated June 27, 2011. This order canceled DOE Manual 231.1-1A dated Sept 9, 2009, which is required by §851.27(b)(9) of the rule.

Contractors, subcontractors, and visitors are required to provide Berkeley Lab with copies of reports for all OSHA-recordable injuries and illnesses occurring on site. Berkeley Lab employees and contract workers are required to report all injuries and occupational illnesses to Health Services. Laboratory reporting requirements are in

addition to, and do not replace, subcontractor employer reporting, recordkeeping, and other obligations under OSHA regulations.

Reference:

- [ES&H Manual, Chapter 5, Injury Response and Review](#)

OCA is responsible for:

- Tracking institutional corrective action plans (CAPs) for deficiencies and hazards related to health and safety
- Analyzing and reporting institutional health and safety data

Berkeley Lab established the Corrective Action Tracking System (CATS) database to track, prioritize, and assess deficiencies and associated hazard abatement and corrective actions at the institutional and divisional levels. The CATS database tracks safety and health issues and deficiencies until they have been resolved and closed. OCA is responsible for analyzing issues and deficiencies from an institutional standpoint to identify trends and issues.

Reference:

- [OCA Web page](#)

The EHS Division is responsible for managing the process for occurrence reporting and incident analysis. This reporting is used to categorize, report, and process information about events or conditions related to Laboratory-controlled or managed buildings, experiments, or other activities in support of Laboratory operations that meet the site-specific reportable occurrence criteria in the DOE Occurrence Reporting and Processing System (ORPS).

Reference:

- [LBNL Occurrence Reporting Web page](#)
- [ES&H Manual, Chapter 15, Occurrence Reporting](#)

The EHS Division is also responsible for recordkeeping, analysis, and reporting 10 CFR 851 safety and health noncompliances using the DOE Noncompliance Tracking System (NTS). DOE's Office of Independent Enterprise Assessments has established NTS reporting thresholds. Noncompliances entered in NTS must have a direct or immediate

relationship to worker safety and health, and must cite specific standards from 10 CFR 851. NTS reporting thresholds are listed in Table 1.1 and 1.2. The EHS Division WSH Enforcement Coordinator screens CATS entries, ORPS, various ES&H program assessments and CAIRS-Injury/Illness reports to determine if they are reportable under the DOE-NTS criteria.

Reference:

- [Price-Anderson Amendments Act \(PAAA\) Compliance Program Manual LBNL](#) .

Table 1.1 DOE NTS reporting thresholds for 10 CFR 851.

Worker Safety and Health Noncompliance Reporting Criteria (as of January 1, 2012)

**Worker Safety and Health Noncompliances Associated With Occurrences
(DOE Order 232.2)**

Consult the DOE Order for the full text of each occurrence criterion¹

Reporting Criteria Group	Subgroup	Occurrence Category and Summary Description ²
1. Operational Emergencies ³	N/A	(1) Operational Emergency (2) Alert (3) Site Area Emergency (4) General Emergency
2. Personnel Safety and Health	A. Occupational Injuries	(1) Fatality/terminal injury (2) Inpatient hospitalization of ≥ 3 personnel (3) Inpatient hospitalization ≥ 5 days (4) ≥ 3 personnel having Days Away, Restricted, or Transferred (DART) cases (5) Serious occupational injury
	B. Occupational Exposure	(1) Fatality/terminal illness or inpatient hospitalization of ≥ 3 personnel (2) Inpatient hospitalization ≥ 5 days or ≥ 3 personnel having DART cases (3) Personnel exposure > 10X limits or > IDLH (4) Personnel exposure > limits but < IDLH requiring medical treatment (5) Exposure resulting in serious occupational injury (6) Personnel exposure > limits but < IDLH
	C. Fires	(1) Fire within primary confinement/containment (2) Fire in a nuclear facility (3) Fire in a non-nuclear facility
	D. Explosions	(1) Unplanned explosion within primary confinement/containment (2) Unplanned explosion in a nuclear facility (3) Unplanned explosion in a non-nuclear facility
	E. Hazardous Electrical Energy Control	(1) Unexpected/unintended personal contact (2) Unexpected discovery of uncontrolled energy source
	F. Hazardous Energy Control (other than electrical)	(1) Unexpected/unintended personal contact (2) Unexpected discovery of uncontrolled energy source
4. Facility Status	B. Operations	(1) Stop Work Order from DOE
10. Management Concerns/Issues	N/A	(1) Initiation of a Federal Accident Investigation (3) Near miss

Table 1.2 DOE NTS reporting thresholds for 10 CFR 851.

Other NTS Worker Safety and Health Reportable Conditions

Reporting Threshold	Notes ⁴
Severity Level I noncompliance(s) with Parts 851 or 850 (Refer to Part 851, Appendix B, Section VI(b)(1)) ⁵	Conditions of noncompliance identified by any method or means (e.g., assessments, inspections, observations, employee concerns, event evaluation) that represent a condition or hazard that has the potential to cause death or serious physical harm (injury or illness). These conditions include imminent danger situations.
Programmatic deficiencies involving noncompliances	A programmatic problem generally involves some weakness in administrative or management controls, or their implementation, to such a degree that a broader management or process control problem exists and requires broad corrective actions.
Repetitive noncompliances	Two or more different events/conditions that involve substantially similar work activities, locations, equipment, or individuals.
Intentional violation or misrepresentation	Also known as willful noncompliance; may involve record falsification.
Substantiated management reprisal(s) against worker(s) for raising safety issues associated with 851.20(a)(6) or (9)	Customarily referred to as worker retaliation.

Notes to Tables

- 1 The simple occurrence of an event or discovery of a condition in any of the listed categories is not by itself sufficient to warrant NTS reporting. NTS reporting requires the identification of a 10 C.F.R. Part 850 or 851 noncompliance in conjunction with the event or discovery. Contractors identifying a significant worker safety and health noncompliance in association with an event/discovery type or category not listed on the table should evaluate the event for NTS reportability, particularly under the “Severity Level I Noncompliances” category.
- 2 These summary descriptions are a brief characterization of the related criteria. Use the full statement of the criteria contained in DOE Order 232.2 to determine NTS reportability of event-related worker safety and health noncompliances.
- 3 Report worker safety and health noncompliances associated with any of the DOE Order 232.2 Operational Emergency categories (Operational Emergency, Alert, Site Area Emergency, General Emergency).
- 4 Refer to Chapter IV of the Enforcement Process Overview for more information about these types of noncompliances.
- 5 Conditions of noncompliance identified by any method or means (e.g., assessments, inspections, observations, employee concerns, event evaluation) that would not otherwise be reported into NTS as either a Management Issue or Occurrence, but that represent a condition or hazard that has the potential to cause death or serious physical harm (injury or illness). These conditions include imminent danger situations.

Identification of trends and development of appropriate hazard abatement is achieved through the analysis of self-assessments, external reviews, event-based occurrences and incidents, and other data.

Additionally, to promote the identification and communication of good practices and lessons learned, Berkeley Lab uses safety and health data to create appropriate and

useful lessons learned. OCA is responsible for maintaining the lessons-learned program as required in DOE Order 210.1.

References:

- [LBNL/PUB-5519 \(4\), Lessons Learned and Best Practices Program Manual](#)

12. Variances, Equivalencies, and Alternate Means of Compliance

12.1 Variances

A variance from a 10 CFR 851 requirement may only be granted by the DOE Under Secretary, after receiving the recommendation of the DOE Assistant Secretary for ES&H. The procedure for obtaining such a variance is described in Subpart D of the Rule, implemented at Berkeley Lab through the RPM, [Variance from Berkeley Lab ES&H Policies](#) process. Variance requests will be prepared with the assistance and support of DOE-SC BSO.

References:

- [RPM, Variance from Berkeley Lab ES&H Policies](#)

12.2 Equivalencies and AHJ Authority

As of May 2008, the date the Rule came into effect, the "Existing Equivalencies" listed in Table 2 are on record at Berkeley Lab. They were variously termed variances, exemptions, or equivalencies at the time they were written. For purposes of compliance with the Rule, these previously addressed and resolved noncompliant conditions are equivalencies granted under the appropriate authority having jurisdiction (AHJ) at their time of issue.

Another method for resolving conditions with questionable compliance used at Berkeley Lab is to develop equivalencies to NFPA and ANSI standards. Equivalency decisions are made by the various designated AHJs for their subject areas based upon the input of their qualified advisors. They are a legal mechanism for approving substitute or alternate control measures when the primary ones are not feasible or practical. For Berkeley Lab, the DOE-SC BSO is the ultimate AHJ and has granted electrical AHJ authority to the University of California, Office of the President, Laboratory Management Office Vice President (UCOP-LMO-VP) to make equivalency decisions. The UCOP-LMO-VP delegated the AHJ responsibility to the Laboratory's Associate Laboratory Director for Operations (ALDO)/Chief Operating Officer (COO).

Table 2. Existing Equivalencies

Date	Subject	Bldg/Program	Issued by
3/90	Lack of rated separation within Building 6 is addressed through the use of a Highly Sensitive Smoke Detection System, which provides equivalent protection.	Building 6 (Advanced Light Source)	DOE-SC BSO Mgr.
6/95	Exiting from Auditorium 66 may not conform to standards. This second-floor, 140-person capacity space has two exit doors exiting to a common hallway, which is divided by a fire door equipped with an automatic closure device. There are two separate pathways to exit the building, providing equivalent exiting capacity.	B66 – Materials Sciences Division	DOE LBNL Facility Ops Engineer

The COO has further delegated this authority to knowledgeable lab individuals, splitting the duties among three areas of jurisdiction: worker Electrical Safety, Electrical Installation, and Electrical Equipment. Depending upon the complexity of the issue, DOE ES&H technical staff participate in the equivalency development process by using a graded approach.

Equivalency evaluations and decisions are usually made by SMEs when a workplace condition or practice is technically complicated and the applicable worker safety and health standards and/or regulations are also complicated, conflicting, or vague. The results of equivalency evaluations and decisions fall into two broad groups: (1) descriptions of how conditions fall within the bounds of a complicated control standard, and (2) descriptions of how and why substitute or alternate controls measures, different from those required by a standard, are necessary when the primary ones are not feasible or practical. The first group of evaluations and decisions is in compliance with standards and requires no further approval; it is discussed in Section 12.3, below. The second group is technically out of compliance with standards until an AHJ has granted a written approval. The legal authority to grant the equivalency flows back from the SME (who has been granted AHJ authority) through the UCOP-LMO-VP to the DOE-SC BSO Manager as allowed by the Rule. The Rule allows AHJ authority to be delegated for electrical safety as well as fire and life safety through the NFPA standards process and for laser safety through the ANSI process.

As discussed above, the DOE-SC BSO Manager has delegated AHJ authority for the electrical-safety program to the UCOP-LMO-VP, who has, in turn, delegated electrical safety AHJ authority and divided it, depending upon the subject matter area. AHJ authority for laser safety has also been delegated to the Laser Safety Officer. AHJ authority for fire and life safety has been retained by the DOE-SC BSO Manager.

References:

- Berkeley Site Office Manager letter, Subject: Delegation of Electrical Authority Having Jurisdiction (AHJ) at Lawrence Berkeley National Laboratory (LBNL) per 10 CFR 851, dated January 29, 2014.
- Berkeley Site Office Manager letter, Subject: Reaffirmation of Authority Having Jurisdiction (AHJ) Delegations, dated February 14, 2013. [Laser and Fire Protection]
- [ES&H Manual, Chapter 8, Section 8.9](#)

12.3 Alternate Means of Compliance

The interpretation of safety and health standards and their application to a research and development environment is often complex. For subject areas not addressed by a DOE-BSO designated AHJ, a written request for a variance from a LBNL ES&H requirement (which generally implement 10CFR851 Rule requirements) may be submitted to the EHS Division Director for approval. Appeals for denied requests go to the Chief Operating Officer, who is the final Berkeley Lab decision maker as to whether a condition is compliant with safety and health requirements.

Another method to resolve noncompliant conditions with negligible hazards is to recognize them as being a *de minimis* condition, a technical violation that has negligible effect on worker safety and health. Such *de minimis* deficiencies will be documented in the Berkeley Lab CATS.

References:

- [RPM, Variance from Berkeley Lab ES&H Policies](#)

13. Enforcement

The Rule authorizes the DOE Secretary of Energy to issue citations and civil monetary penalties to contractors such as Berkeley Lab that are indemnified by the Price-Anderson Amendments Act for violations of DOE worker safety and health requirements. The Secretary's enforcement authority is implemented through the Office of Independent Enterprise Assessments, Worker Safety and Health Enforcement Office.

The DOE Worker Safety and Health Enforcement Program relies on contractors to voluntarily identify and report 10 CFR 851 noncompliances, thereby allowing DOE to regulate its operations without the expense and intrusiveness of an inspection-based system, such as that used by the Nuclear Regulatory Commission to regulate commercial nuclear power plants.

Procedures for implementing the enforcement process are found in Subpart E of the Rule. The enforcement process is shown in Appendix G of this Plan.

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Appendix A Glossary

ACGIH American Conference of Governmental Industrial Hygienists

Affected worker. A worker who would be affected by the granting or denial of a variance, or any authorized representative of the worker, such as a collective bargaining agent.

AHJ Authority Having Jurisdiction

ANSI American National Standards Institute

ASME American Society of Mechanical Engineers

BSO Berkeley Site Office

Casual Visitor A casual visitor is an individual visiting the Laboratory for a week or less who is not conducting Laboratory research or using Laboratory facilities. Casual visitor status may be extended to two weeks by application to the Site Access Administrator. This category of visitor includes, but is not limited to, those giving or attending seminars, those visiting the Laboratory for limited scientific discussions or as nonparticipants solely to observe research in progress, radiotherapy patients, job seekers, tour groups, employee family/friends, retired employees with occasional reason to visit the site, and the press. (See also definitions for contractor, employee, worker, and participating guest.)

CAP Corrective Action Plan

CATS The Berkeley Lab computer based Corrective Action Tracking System

CFR Code of Federal Regulations

Closure facility. A facility that is nonoperational and is, or is expected to be, permanently closed and/or demolished, or that is expected to be transferred to another entity for reuse.

Closure facility hazard. Refers only to facility-related conditions within a closure facility involving deviations from the technical requirements of 851.23 of the Rule that would require costly and extensive structural and engineering modifications to be in compliance. Closure facilities may have other hazards as well.

Contract 31 DOE/University of California (UC)/LBNL Prime Contract 31 (Contract No. DE-AC02-05CH11231)

Contractor. Any entity, including affiliated entities, such as a parent corporation, under contract with DOE, including a subcontractor at any tier, with responsibility for performing work at a DOE site in furtherance of a DOE mission. As stated in the Rule, all contractors and subcontractors at any tier are covered under this definition. The definition does not, however, apply to contractors or subcontractors that provide only "commercial items" as defined under the Federal Acquisition Regulations (FAR). Such contractors would not be performing work in furtherance of a DOE mission. (See also definitions for employee, worker, participating guest and casual visitor.)

· As defined in 10 CFR 851

Covered workplace. A place at a DOE site where a contractor is responsible for performing work in furtherance of a DOE mission.

CVC California Vehicle Code

D&D decommissioning and demolition

DOE. The United States Department of Energy, including the National Nuclear Security Administration.

DOE-SC DOE Office of Science

DOE site. A DOE-owned or leased area or location, or other area or location controlled by DOE where a contractor furthers a DOE mission by carrying out activities and operations at one or more facilities or places. This definition includes all sites where DOE exercises regulatory control under the Atomic Energy Act (AEA), even if DOE does not own or lease the site.

EAP Employee Assistance Program

Employee A person hired by the University of California to work at Berkeley Lab. This includes exempt and nonexempt employees, but not affiliates or casual visitors. (See also definitions for contractor, worker, participating guest, and casual visitor.)

ESN Engineering Safety Note

ES&H Environment, Safety, and Health. References to ES&H in this document are limited to the protection of workers from workplace safety and health hazards. Environmental management is outside the scope of the Program.

GERT General Employee Radiation Training

Facility Management Includes individuals who have responsibility for maintaining the safety envelope for facilities.

Health and Safety Manual PUB-3000

HEERA Higher Education Employer–Employee Relations

IARC International Agency for Research on Cancer

Incorporate by reference Only the referenced document is incorporated by reference; references cited in the incorporated document are not included.

ISM Integrated Safety Management

ISMS Integrated Safety Management System

ISMS Plan LBNL *Integrated Safety Management System Plan* LBNL/PUB-3140

JBEI Joint BioEnergy Institute

JGI-PGF Joint Genome Institute–Production Genome Facility

JHA Job Hazards Analysis

LBNL Lawrence Berkeley National Laboratory

LOTO Lockout/Tagout

NBIC National Board Inspection Code

NFPA National Fire Protection Association

NIOSH National Institute for Occupational Safety and Health

NRTL Nationally Recognized Testing Laboratory

NTP National Toxicology Program

NTS DOE Noncompliance Tracking System

OCA Office of Contractor Assurance

OJT On-the-Job Training

ORPS Occurrence Reporting and Processing System

OSHA Occupational Safety and Health Administration

PAAA Price-Anderson Amendments Act

Participating Guest A non-Laboratory employee who is engaged in Laboratory activities on site, and who falls into one or more of the following categories (see also definitions for contractor, worker, employee, and casual visitor):

- **Users** Individuals visiting the Laboratory to use Laboratory User Facilities, defined as "Designated User Facilities" or "Other User Resources" by DOE Office of Science.
- **National Energy Research Scientific Computing Center (NERSC) Users** Individuals using NERSC facilities either remotely or while visiting the Laboratory.
- **Scientific Collaborators** Individuals visiting the Laboratory who are engaged in Laboratory-approved research, testing, or analysis either through "hands-on" activities or through collaborative discussions with Laboratory employees. Included in this category are faculty and graduate students from other University of California facilities and other educational institutions, fellowship students, postdoctoral fellows, research fellows, and other professionals having adequate training and experience and meeting high professional standards in their fields.
- **Student Guests** Individuals who are graduate students under the direct supervision of a division to which the student is attached.
- **Nonscientific** Individuals who have been assigned to the Laboratory as their place of work either as employees of temporary employment services/agencies or as contract labor employees.
- **Consultants** Individuals who have entered into a consultant agreement with the Laboratory under the terms of [RPM Section 2.24](#) (Consultants to Lawrence Berkeley National Laboratory).

PUB-3000 The Berkeley Lab Health and Safety Manual

PUB-3111 Quality Assurance Program Description (QAPD)

QAPD Quality Assurance Program Description (PUB-3111)

RPM Requirements and Policies Manual

Safety and health standard A standard that addresses a workplace hazard by establishing limits, requiring conditions, or prescribing the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe and healthful workplaces.

SME Subject Matter Expert

UCB University of California at Berkeley

UCOP University of California Office of the President

Worker. An employee of a DOE contractor who performs work in furtherance of a DOE mission at a covered workplace. (See also definitions for contractor, employee, participating guest, and casual visitor.)

Work Lead A Work Lead is anyone who directs, trains, and/or oversees the work and activities of one or more workers. Work Leads provide instruction on working safely and the precautions necessary to use equipment and facilities safely and effectively. Work Leads need not be Line Managers, HEERA-designated Supervisors, or Berkeley Lab Employees.

Workplace hazard. Physical, chemical, biological, or safety hazard with any potential to cause illness, injury, or death to a person.

WSHP Worker Safety and Health Program

· As defined in 10 CFR 851

Appendix B

LBNL Off-Site, Leased Facilities as of May 9, 2014

LBNL Bld. #	Common Name	Address	Use	Tenant/User Group
1	Donner Laboratory	UC Berkeley Campus	Research lab and admin.	Physical Biosciences and Life Sciences
100 and 400	JGI/PGF Facility Offices and Labs	2800 Mitchell Drive Buildings 100 and 400 Walnut Creek, CA. 94598	Commercial lab and admin.	Production Genomics Facility (PGF) of the Joint Genome Institute (JGI)
310	JGI/PGF Facility Offices and Labs	2800 Mitchell Drive Building 310 Walnut Creek, CA. 94598	Commercial lab and admin.	Production Genomics Facility (PGF) of the Joint Genome Institute (JGI)
500	JGI/PGF Facility Warehouse	2800 Mitchell Drive Building 500 Walnut Creek, CA. 94598	Commercial warehouse	Production Genomics Facility (PGF) of the Joint Genome Institute (JGI)
943	Oakland Scientific Facility (OSF) National Energy Research Scientific Computing Center (NERSC)	415 20th Street Oakland, CA. 94612	Commercial lab and admin., super-computing	Under two separate leases: 1st and 2nd floors are used by NERSC/LBNL; 3rd and 4th floors are used by UCOP as office space (LBNL does not pay rent for this space; it is solely UCOP space)
965	Network Operations Center at Livermore Kitty Hawk	2600 Kitty Hawk Road Suite 116 Livermore, CA 94551	Commercial admin.	Computational Research Division - ESnet (Energy Science Network)
971	OCFO Offices	6401 Hollis St. Emeryville, CA 94608	Offices	OCFO Groups
972	PBD Kbase	5858 Horton St. Emeryville, CA 94608	Research	Physical Biosciences Division - 972 houses DOE's new Knowledgebase (Kbase) Project, a multi-institutional effort to consolidate the numerous different sources of scientific information on plants and microbes into a single integrated cyber-database.
977	Joint LBNL/UCB Bioscience Research Center	717 Potter Street Berkeley, CA 94710	Commercial lab and admin.	Genomes to Life (LBNL) Berkeley Structural Genomics Center "BRIDGE"-Biotechnology Resource for Interdisciplinary Discovery and Genome Engineering (LBNL, UCB, UCSF, private industry) Synthetic Biology (UCB)
978	JBEI (Joint BioEnergy Institute)	5885 Hollis Street Emeryville, CA 94608	Commercial lab and admin.	JBEI is a scientific partnership led by Berkeley Lab and includes the Sandia National Laboratories (Sandia), Lawrence Livermore National Laboratory, UC campuses of Berkeley and Davis, and the Carnegie Institution for Science, located at Stanford University and other such institutions as may be included from time to time.

LBNL Bld. #	Common Name	Address	Use	Tenant/User Group
978 3 rd flr	PDU - Advanced Biofuels Process Development Unit	5885 Hollis Street Emeryville, CA 94608	Commercial lab and admin.	Physical Biosciences Division (PBD), facility for entities to scale-up and demonstrate (at a small-scale) newly developed processes and technologies for bio fuels
976	JCAP – Joint Center for Artificial Photosynthesis	2929 Seventh Street Berkeley, CA 94710	Commercial lab and admin.	Materials Sciences Division (MSD) to demonstrate a scalably manufacturable solar-fuels generator, using Earth-abundant elements, that robustly produces fuel from the sun 10 times more efficiently than (current) crops
1 555	SURF Residence	314 Mill Street Lead, SD 57754	Lodging Space	Housing for LBNL staff from the SURF operations office the the LUX/MJD experiments
7 605	Test House	4209 Cold Creek Way Sacramento. CA 95838	Air Quality Sampling	EETD

* Master list obtained from the Berkeley Lab Facilities Division Planning Organization.

Appendix C

List of Memoranda of Understanding and Agreements

1. March 15, 2004, [Partnership Agreement Between UCB and LBNL Concerning Environment, Health and Safety Policy and Procedures](#)
2. November 7, 2006, [JGI Memorandum of Understanding \(Regarding ES&H\)](#)
3. November 9, 2007, Joint BioEnergy Institute Environment, Safety, and Health (ES&H) Responsibilities Matrix

Appendix D

10 CFR 851 Implementation Matrix

851 Section	851 Text	Corresponding LBNL WSHP Section
851.1 (a)	The worker safety and health requirements in this part govern the conduct of contractor activities at DOE sites.	Executive Summary 1.2 Locations
851.1 (b)(1)	This part establishes the: Requirements for a worker safety and health program that reduces or prevents occupational injuries, illnesses, and accidental losses by providing DOE contractors and their workers with safe and healthful workplaces at DOE sites; and	1.4 Purpose
851.1 (b)(2)	Procedures for investigating whether a violation of a requirement of this part has occurred, for determining the nature and extent of any such violation, and for imposing an appropriate remedy.	13 Enforcement
851.2 (a)(1)	This part does not apply to work at a DOE site: (1) Regulated by the Occupational Safety and Health Administration; or	1.8 Exclusions
851.2 (a)(2)	Operated under the authority of the Director, Naval Nuclear Propulsion, pursuant to Executive Order 12344, as set forth in Public Law 98-525, 42 U.S.C. 7158 <i>note</i> .	1.8 Exclusions
851.2 (b)	This part does not apply to radiological hazards or nuclear explosives operations to the extent regulated by 10 CFR Parts 20, 820, 830, or 835.	1.8 Exclusions
851.2 (c)	This part does not apply to transportation to or from a DOE site.	1.8 Exclusions
851.10 (a)(1)	With respect to a covered workplace for which a contractor is responsible, the contractor must: Provide a place of employment that is free from recognized hazards that are causing or have the potential to cause death or serious physical harm to workers; and	LBNL WSHP
851.10 (a)(2)(i)&(ii)	Ensure work is performed in accordance with: (i) All applicable requirements of this part; and (ii) With the worker safety and health program for that workplace.	LBNL WSHP
851.10 (b)(1)	The written worker safety and health program must describe how the contractor complies with the: Requirements set forth in Subpart C of this part that are applicable to the hazards associated with the contractor's scope of work	LBNL WSHP
851.10 (b)(2)	Section 850.10(b)(2) specifies that the written program must comply with any compliance order issued by the Secretary pursuant to section 851.4.	2.3 Responding to DOE Compliance orders
851.11 (a)	Preparation and submission of Worker Safety and Health Program. By Feb. 26, 2007, contractors must submit for approval by the appropriate Head of DOE Field Element a written Worker Safety and Health Program that provides the methods for implementing the requirements of Subpart C of this part.	1.9 DOE-SC Berkeley Site Office Manager 1.10 DOE Approval

851.11 (a)(1)	If a contractor is responsible for more than one covered workplace at a DOE site, the contractor must establish and maintain a single worker safety and health program for the covered workplaces for which the contractor is responsible.	1.2 Locations
851.11 (a)(2)(i)&(ii)	If more than one contractor is responsible for covered workplaces, each contractor must: (i) Establish and maintain a worker safety and health program for the workplaces for which the contractor is responsible; and (ii) Coordinate with the other contractors responsible for work at the covered workplaces to ensure that there are clear roles, responsibilities, and procedures to ensure the safety and health of workers at multicontractor workplaces.	1.5 Scope 1.6 Flow Down of 851 Requirements To Subcontractors
		1.1 Work Activities
		1.3 Workforce
		1.4 Purpose
851.11 (a)(3)(i)&(ii)	The Worker Safety and Health Program must describe how the contractor will: (i) Comply with the requirements set forth in Subpart C of this part that are applicable to the covered workplace, including the methods for implementing those requirements; and (ii) Integrate the requirements set forth in Subpart C of this part that are applicable to a covered workplace with other related site-specific worker protection activities and with the ISMS.	LBNL WSHP
851.11 (b)(1)&(2)	DOE evaluation and approval. The Head of DOE Field Element must complete a review and provide written approval of the contractor's Worker Safety and Health Program, within 90 days of receiving the document. The Worker Safety and Health Program and any updates are deemed approved 90 days after submission if they are not specifically approved or rejected by DOE earlier. (1) Beginning May 25, 2007, no work may be performed at a covered workplace unless an approved Worker Safety and Health Program is in place for the workplace. (2) Contractors must send a copy of the approved program to the Assistant Secretary for Environment, Safety and Health.	Not Included in WSHP
851.11 (b)(3)	Contractors must furnish a copy of the approved Worker Safety and Health Program, upon written request, to the affected workers or their designated representatives.	1.7 Coordination with Labor Organizations
851.11 (c)(1),(2)&(3)	Updates. (1) Contractors must submit an update of the Worker Safety and Health Program to the appropriate Head of DOE Field Element, for review and approval whenever a significant change or addition to the program is made, or a change in contractors occurs. (2) Contractors must submit annually to DOE either an updated Worker Safety and Health Program for approval or a letter stating that no changes are necessary in the currently approved Worker Safety and Health Program. (3) Contractors must incorporate in the Worker Safety and Health Program any changes, conditions, or workplace safety and health standards directed by DOE consistent with the requirements of this part and DEAR 970.5204-2, Laws, Regulations and DOE Directives (December 2000) and associated contract clauses.	1.11 Revisions
851.11 (d)(1)&(2)	If a contractor employs or supervises workers who are represented for collective bargaining by a labor organization, the contractor must: (1) Give the labor organization timely notice of the development and implementation of the Worker Safety and Health Program and any updates thereto; and (2) Upon timely request, bargain concerning implementation of this part, consistent with the Federal labor laws	1.7 Coordination with Labor Organizations

851.12 (a)&(b)	(a) Contractors must implement the requirements of this part. (b) Nothing in this part precludes a contractor from taking any additional protective action that is determined to be necessary to protect the safety and health of workers.	LBNL WSHP
851.13 (a)	Contractors must achieve compliance with all the requirements of Subpart C of this part, and their approved Worker Safety and Health Program no later than May 25, 2007. Contractors may be required to comply contractually with the requirements of this rule before February 9, 2007.	LBNL WSHP
851.13 (b)	In the event a contractor has established a written safety and health program, an ISMS description pursuant to the DEAR Clause, or an approved Work Smart Standards (WSS) process before the date of issuance of the final rule, the Contractor may use that program, description, or process as the Worker Safety and Health Program required by this part if the appropriate Head of the DOE Field Element approves such use on the basis of written documentation provided by the contractor that identifies the specific portions of the program, description, or process, including any additional requirements or implementation methods to be added to the existing program, description, or process, that satisfy the requirements of this part and that provide a workplace as safe and healthful as would be provided by the requirements of this part.	Not Applicable – wrote new WSHP
851.13 (c)	Nothing in this part shall be construed to limit or otherwise affect contractual obligations of a contractor to comply with contractual requirements that are not inconsistent with the requirements of this part.	LBNL WSHP
851.20	Management responsibilities Contractors are responsible for the safety and health of their workforce and must ensure that contractor management at a covered workplace:	4 Management Responsibilities
851.20 (a)(1)	Establish written policy, goals, and objectives for the Worker Safety and Health Program;	4.1 Safety Policy, ISMS Guiding Principles, ES&H Goals, and ES&H Objectives
851.20 (a)(2)	Use qualified worker safety and health staff (e.g., a certified industrial hygienist, or safety professional) to direct and manage the program;	4.2 Qualified Worker Safety & Health Staff
851.20 (a)(3)	Assign Worker Safety and Health Program responsibilities, evaluate personnel performance, and hold personnel accountable for worker safety and health performance;	4.3 Accountability
851.20 (a)(4)	Provide mechanisms to involve workers and their elected representatives in the development of the Worker Safety and Health Program goals, objectives, and performance measures and in the identification and control of hazards in the workplace;	1.7 Coordination with Labor Organizations
851.20 (a)(5)	Provide workers with access to information relevant to the Worker Safety and Health Program;	4.5 Access to Information
851.20 (a)(6)	Establish procedures for workers to report without reprisal job-related fatalities, injuries, illnesses, incidents, and hazards and make recommendations about appropriate ways to control those hazards;	4.6 Responding to Reports
851.20 (a)(7)	Provide for prompt response to such reports and recommendations;	4.6 Responding to Reports
851.20 (a)(8)	Provide for regular communication with workers about workplace safety and health matters;	4.7 Safety & health Communications

851.20 (a)(9)	Establish procedures to permit workers to stop work or decline to perform an assigned task because of a reasonable belief that the task poses an imminent risk of death, serious physical harm, or other serious hazard to workers, in circumstances where the workers believe there is insufficient time to utilize normal hazard reporting and abatement procedures; and	4.8 Stop Work Authority
851.20 (a)(10)	Inform workers of their rights and responsibility by appropriate means, including posting the DOE-designated Worker Protection Poster in the workplace where it is accessible to all workers.	4.9 Informing Workers of Rights
		4.10 Budgeting For Safety
851.20 (b)	Worker rights and responsibilities. Workers must comply with the requirements of this part, including the Worker Safety and Health Program, which are applicable to their own actions and conduct. Workers at a covered workplace have the right, without reprisal, to:	5 Worker Rights
851.20 (b)(1)	Participate in activities described in this section on official time;	5.1 Participating on Official Time
851.20 (b)(2)(i)	DOE safety and health publications;	5.2 Access to Information
851.20 (b)(2)(ii)	The Worker Safety and Health Program for the covered workplace;	5.2 Access to Information
851.20 (b)(2)(iii)	The standards, controls, and procedures applicable to the covered workplace;	5.2 Access to Information
851.20 (b)(2)(iv)	The safety and health poster that informs the worker of relevant rights and responsibilities;	5.2 Access to Information
851.20 (b)(2)(v)	Limited information on any recordkeeping log (OSHA Form 300). Access is subject to Freedom of Information Act requirements and restrictions; and	5.2 Access to Information
851.20 (b)(2)(vi)	The DOE Form 5484.3 (the DOE equivalent to OSHA Form 301) that contains the employee's name as the injured or ill worker;	5.2 Access to Information
851.20 (b)(3)	Be notified when monitoring results indicate the worker was overexposed to hazardous materials;	5.3 Notification of Monitoring Results
851.20 (b)(4)	Observe monitoring or measuring of hazardous agents and have the results of their own exposure monitoring;	5.4 Observation of Monitoring
851.20 (b)(5) 851.20 (b)(6)	A representative authorized by employees may accompany the Director or his authorized personnel during the physical inspection of the workplace for the purpose of aiding the inspection. When no authorized employee representative is available, the Director or his authorized representative must consult, as appropriate, with employees on matters of worker safety and health; Request and receive results of inspections and accident investigations;	5.5 Inspections
851.20 (b)(7)	Express concerns related to worker safety and health;	5.6 Worker Concerns
851.20 (b)(8)	Decline to perform an assigned task because of a reasonable belief that, under the circumstances, the task poses an imminent risk of death or serious physical harm to the worker coupled with a reasonable belief that there is insufficient time to seek effective redress through normal hazard reporting and abatement procedures; and	5.7 Refusal to Work

851.20 (b)(9)	Stop work when the worker discovers employee exposures to imminently dangerous conditions or other serious hazards; provided that any stop work authority must be exercised in a justifiable and responsible manner in accordance with procedures established in the approved Worker Safety and Health Program.	5.8 Stop Work Authority
		6 Worker Responsibilities
		6.1 Safety
		6.2 Reporting Hazards
		6.3 Reporting Injuries and Illnesses
851.21	Hazard identification and assessment.	7 Hazard Identification and Assessment
851.21 (a)	Contractors must establish procedures to identify existing and potential workplace hazards and assess the risk of associated workers injury and illness. Procedures must include methods to:	7.1 Identifying Workplace Hazards and Assessing Risk
851.21 (a)(1)	Assess worker exposure to chemical, physical, biological, or safety workplace hazards through appropriate workplace monitoring;	7.2 Worker Exposure Assessment
851.21 (a)(2)	Document assessment for chemical, physical, biological, and safety workplace hazards using recognized exposure assessment and testing methodologies and using of accredited and certified laboratories;	7.3 Documenting & Recording Workplace
851.21 (a)(3)	Record observations, testing and monitoring results;	7.3 Documenting & Recording Workplace Assessments
851.21 (a)(4)	Analyze designs of new facilities and modifications to existing facilities and equipment for potential workplace hazards;	7.4 New Construction and Facilities Modifications Design
851.21 (a)(5)	Evaluate operations, procedures, and facilities to identify workplace hazards;	7.5 Evaluating Operations, Procedures & Facilities
851.21 (a)(6)	Perform routine job activity-level hazard analyses;	7.6 Activity-Level Hazard Analysis
851.21 (a)(7)	Review site safety and health experience information; and	7.7 Reviewing Safety and Health Experience
851.21 (a)(8)	Consider interaction between workplace hazards and other hazards such as radiological hazards.	7.8 Interactions Between Workplace and Other Hazards
851.21 (b)	Contractors must submit to the Head of DOE Field Element a list of closure facility hazards and the established controls within 90 days after identifying such hazards. The Head of DOE Field Element, with concurrence by the Cognizant Secretarial Officer, has 90 days to accept the closure facility hazard controls or direct additional actions to either:	7.9 Closure Facilities Hazards & Controls
851.21 (b)(1)	Achieve technical compliance; or	7.9 Closure Facilities Hazards & Controls
851.21 (b)(2)	Provide additional controls to protect the workers.	7.9 Closure Facilities Hazards & Controls
851.21 (c)	Contractors must perform the activities identified in paragraph (a) of this section, initially to obtain baseline information and as often thereafter as necessary to ensure compliance with the requirements in this Subpart.	7.2 Worker Exposure Assessment

851.22 (a)	Hazard prevention and abatement. Contractors must establish and implement a hazard prevention and abatement process to ensure that all identified and potential hazards are prevented or abated in a timely manner.	8 Hazard Control and Abatement
851.22 (a)(1)	For hazards identified either in the facility design or during the development of procedures, controls must be incorporated in the appropriate facility design or procedure.	8.1 Development of Controls From Facility Design & Procedures Development
851.22 (a)(2)	For existing hazards identified in the workplace, contractors must:	8.2 Managing Identified Safety & Health Noncompliances
851.22 (a)(2)(i)	Prioritize and implement abatement actions according to the risk to workers;	8 Hazard Control and Abatement
851.22 (a)(2)(ii)	Implement interim protective measures pending final abatement; and	8.2 Managing Identified Safety & Health Noncompliances
851.22 (a)(2)(iii)	Protect workers from dangerous safety and health conditions;	8 Hazard Control and Abatement
851.22 (b)	Contractors must select hazard controls based on the following hierarchy:	8 Hazard Control and Abatement
851.22 (b)(1)	Elimination or substitution of the hazards where feasible and appropriate;	8 Hazard Control and Abatement
851.22 (b)(2)	Engineering controls where feasible and appropriate;	8 Hazard Control and Abatement
851.22 (b)(3)	Work practices and administrative controls that limit worker exposures; and	8 Hazard Control and Abatement
851.22 (b)(4)	Personal protective equipment.	8 Hazard Control and Abatement
851.22 (c)	Contractors must address hazards when selecting or purchasing equipment, products, and services.	8.3 Purchasing Equipment, Products, and Services
851.23	Safety & Health Standards (a) Contractors must comply with the following safety and health standards that are applicable to the hazards at their covered workplace: (1) Title 10 Code of Federal Regulations (CFR) 850, "Chronic Beryllium Disease Prevention Program." (2) Title 29 CFR, Parts 1904.4 through 1904.11, 1904.29 through 1904.33; 1904.44, and 1904.46, "Recording and Reporting Occupational Injuries and Illnesses." (3) Title 29 CFR, Part 1910, "Occupational Safety and Health Standards," excluding 29 CFR 1910.1096, "Ionizing Radiation." (4) Title 29 CFR, Part 1915, "Shipyard Employment."	9 Safety and Health Standards

	<p>(5) Title 29 CFR, Part 1917, "Marine Terminals."</p> <p>(6) Title 29 CFR, Part 1918, "Safety and Health Regulations for Longshoring."</p> <p>(7) Title 29 CFR, Part 1926, "Safety and Health Regulations for Construction."</p> <p>(8) Title 29 CFR, Part 1928, "Occupational Safety and Health Standards for Agriculture."</p> <p>(9) American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" when the ACGIH Threshold Limit Values (TLVs) are lower (more protective) than permissible exposure limits in 29 CFR 1910. When the ACGIH TLVs are used as exposure limits, contractors must nonetheless comply with the other provisions of any applicable expanded health standard found in 29 CFR 1910.</p> <p>(10) American National Standards Institute (ANSI) Z88.2, "American National Standard Practices for Respiratory Protection," (2004) (incorporated by reference see § 851.27).</p> <p>(11) ANSI Z136.1, "Safe Use of Lasers," (2000) (incorporated by reference see § 851.27).</p> <p>(12) ANSI Z49.1, "Safety in Welding, Cutting and Allied Processes," sections 4.3 and E4.3 (1999) (incorporated by reference see § 851.27).</p> <p>(13) National Fire Protection Association (NFPA) 70, "National Electrical Code," (2005) (incorporated by reference see § 851.27).</p> <p>(14) NFPA 70E, "Electrical Safety in the Workplace," (2004) (incorporated by reference see § 851.27).</p> <p>(b) Nothing in this part must be construed as relieving a contractor from complying with any additional specific safety and health requirement that it determines to be necessary to protect the safety and health of workers.</p>	
851.24 (a)&(b)	<p>(a) Contractors must have a structured approach to their Worker Safety and Health Program which at a minimum, include provisions for the following applicable functional areas in their Worker Safety and Health Program: construction safety; fire protection; firearms safety; explosives safety; pressure safety; electrical safety; industrial hygiene; occupational medicine; biological safety; and motor vehicle safety.</p> <p>(b) In implementing the structured approach required by paragraph (a) of this section, contractors must comply with the applicable standards and provisions in Appendix A of this part, entitled "Worker Safety and Health Functional Areas."</p>	LBNL WSHP
851.25	Training and information	10 Training
851.25 (a)	Contractors must develop and implement a worker safety and health training and information program to ensure that all workers exposed or potentially exposed to hazards are provided with the training and information on that hazard in order to perform their duties in a safe and healthful manner.	10 Training
851.25 (b)(1)	Training and information for new workers, before or at the time of initial assignment to a job involving exposure to a hazard;	10 Training
851.25 (b)(2)	Periodic training as often as necessary to ensure that workers are adequately trained and informed; and	10 Training
851.25 (b)(3)	Additional training when safety and health information or a change in workplace conditions indicates that a new or increased hazard exists.	10 Training
851.25 (c)	Contractors must provide training and information to workers who have Worker Safety and Health Program responsibilities that is necessary for them to carry out those responsibilities.	10 Training

§ 851.26 (a)(1)	Contractors must: Establish and maintain complete and accurate records of all hazard inventory information, hazard assessments, exposure measurements, and exposure controls.	Chapter 11 Recordkeeping and Reporting
§ 851.26 (a)(2)	Ensure that the work-related injuries and illnesses of its workers and subcontractor workers are recorded and reported accurately and consistent with DOE Manual 231.1-1A, Environment, Safety and Health Reporting Manual, September 9, 2004 (incorporated by reference, see §851.27).	Chapter 11 Recordkeeping and Reporting
§ 851.26 (a)(3)	Comply with the applicable occupational injury and illness recordkeeping and reporting workplace safety and health standards in § 851.23 of this part at their site, unless otherwise directed in DOE Manual 231.1-1A.	11 Recordkeeping and Reporting
§ 851.26 (a)(4)	Not conceal nor destroy any information concerning non-compliance or potential noncompliance with the requirements of this part.	11 Recordkeeping and Reporting
851.26 (b)(1)	Contractors must: Report and investigate accidents, injuries and illness; and	11 Recordkeeping and Reporting
851.26 (b)(2)	Analyze related data for trends and lessons learned (reference DOE Order 225.1A, Accident Investigations, November 26, 1997).	11 Recordkeeping and Reporting
		12 Variances, Code of Record and Equivalencies
		13 Enforcement
		Appendix A Glossary
		Appendix B LBNL Offsite, Leased Facilities
		Appendix C List of Memorandums of Understanding and Agreements
		Appendix D 10 CFR 851 Implementation Matrix
		Appendix E List of Closure Facilities, Hazards and Controls
		Appendix F Functional Areas
App. A1	Construction safety.	App. F1 Construction Safety
App. A1 (a)	For each separately definable construction activity (e.g., excavations, foundations, structural steel, roofing) the construction contractor must:	App. F1 Construction Safety
App. A1 (a)(1)	Prepare and have approved by the construction manager an activity hazard analysis prior to commencement of affected work. Such analyses must:	App. F1 Construction Safety
App. A1 (a)(1)(i)	Identify foreseeable hazards and planned protective measures;	App. F1 Construction Safety

App. A1 (a)(1)(ii)	Address further hazards revealed by supplemental site information (e.g., site characterization data, as-built drawings) provided by the construction manager;	App. F1 Construction Safety
App. A1 (a)(1)(iii)	Provide drawings and/or other documentation of protective measures for which applicable Occupational Safety and Health Administration (OSHA) standards require preparation by a Professional Engineer or other qualified professional, and	App. F1 Construction Safety
App. A1 (a)(1)(iv)	Identify competent persons required for workplace inspections of the construction activity, where required by OSHA standards.	App. F1 Construction Safety
App. A1 (a)(2)	Ensure workers are aware of foreseeable hazards and the protective measures described within the activity analysis prior to beginning work on the affected activity.	App. F1 Construction Safety
App. A1 (a)(3)	Require that workers acknowledge being informed of the hazards and protective measures associated with assigned work activities. Those workers failing to utilize appropriate protective measures must be subject to the construction contractor's disciplinary process.	App. F1 Construction Safety
App. A1 (b)	During periods of active construction (i.e., excluding weekends, weather delays, or other periods of work inactivity), the construction contractor must have a designated representative on the construction worksite who is knowledgeable of the project's hazards and has full authority to act on behalf of the construction contractor. The contractor's designated representative must make frequent and regular inspections of the construction worksite to identify and correct any instances of noncompliance with project safety and health requirements.	App. F1 Construction Safety
App. A1 (c)	Workers must be instructed to report to the construction contractor's designated representative hazards not previously identified or evaluated. If immediate corrective action is not possible or the hazard falls outside of project scope, the construction contractor must immediately notify affected workers, post appropriate warning signs, implement needed interim control measures, and notify the construction manager of the action taken. The contractor or the designated representative must stop work in the affected area until appropriate protective measures are established.	App. F1 Construction Safety
App. A1 (d)	The construction contractor must prepare a written construction project safety and health plan to implement the requirements of this section and obtain approval of the plan by the construction manager prior to commencement of any work covered by the plan. In the plan, the contractor must designate the individual(s) responsible for on-site implementation of the plan, specify qualifications for those individuals, and provide a list of those project activities for which subsequent hazard analyses are to be performed. The level of detail within the construction project safety and health plan should be commensurate with the size, complexity and risk level of the construction project. The content of this plan need not duplicate those provisions that were previously submitted and approved as required by § 851.11 of this part.	App. F1 Construction Safety
App. A2	Fire protection.	App. F2 Fire Protection
App. A2 (a)	Contractors must implement a comprehensive fire safety and emergency response program to protect workers commensurate with the nature of the work that is performed. This includes appropriate facility and site-wide fire protection, fire alarm notification and egress features, and access to a fully staffed, trained, and equipped emergency response organization that is capable of responding in a timely and effective manner to site emergencies.	App. F2 Fire Protection
App. A2 (b)	An acceptable fire protection program must include those fire protection criteria and procedures, analyses, hardware and systems, apparatus and equipment, and personnel that would comprehensively ensure that the objective in paragraph 2(a) of this section is met. This includes meeting applicable building codes and National Fire Protection Association codes and standards.	App. F2 Fire Protection

App. A3	Explosives Safety	App.F3 Explosives Safety Not Applicable at LBNL
App. A4	<p>Pressure safety.</p> <p>Contractors must establish safety policies and procedures to ensure that pressure systems are designed, fabricated, tested, inspected, maintained, repaired, and operated by trained and qualified personnel in accordance with applicable and sound engineering principles</p> <p>Contractors must ensure that all pressure vessels, boilers, air receivers, and supporting piping systems conform to:</p> <p>The applicable American Society of Mechanical Engineers (ASME) Boilers and Pressure Vessel Code; sections I through section XII including applicable Code Cases</p> <p>The applicable ASME B.31 Standards of Pressure Piping; and or;</p> <p>The strictest applicable state and local codes.</p> <p>When national consensus codes are not applicable (because of pressure range, vessel geometry, use of special materials, etc.), contractors must implement measures to provide equivalent protection and ensure a level of safety greater than or equal to the level of protection afforded by the ASME or applicable state or local code. Measures must include the following:</p> <p>Design drawings, sketches, and calculations must be reviewed and approved by a qualified independent design professional (i.e., professional engineer). Documented organizational peer review is acceptable.</p> <p>Qualified personnel must be used to perform examinations and inspections of materials, in-process fabrications, non-destructive tests, and acceptance test.</p> <p>Documentation, traceability, and accountability must be maintained for each pressure vessel or system, including descriptions of design, pressure, testing, operation, repair, and maintenance.</p>	App. F4 Pressure Safety
App A5	Firearms Safety	App. F5 Firearms Safety Not Applicable at LBNL
App. A6	<p>Industrial Hygiene</p> <p>Contractors must implement a comprehensive industrial hygiene program that includes at least the following elements:</p> <ul style="list-style-type: none"> (a) Initial or baseline surveys and periodic resurveys and /or exposure monitoring as appropriate of all work areas or operations to identify and evaluate potential worker health risks; (b) Coordination with planning and design personnel to anticipate and control health hazards that proposed facilities and operations would introduce; (c) Coordination with cognizant occupational medical, environmental, health physics, and work planning professionals; (d) Policies and procedures to mitigate the risk from identified and potential occupational carcinogens; (e) Professionally and technically qualified industrial hygienists to manage and implement the industrial hygiene program; and (f) Use of respiratory protection equipment tested under the DOE Respirator 	App F6 Industrial Hygiene

	<p>Acceptance Program for Supplied-air Suits (DOE-Technical Standard-1167-2003) when National Institute for Occupational Safety and Health-approved respiratory protection does not exist for DOE tasks that require such equipment. For security operations conducted in accordance with Presidential Directive Decision 39, U.S. POLICY ON COUNTER TERRORISM, use of Department of Defense military type masks for respiratory protection by security personnel is acceptable.</p>	
<p>App. A7</p>	<p>Biological safety.</p> <p>(a) Contractors must establish and implement a biological safety program that:</p> <p>(1) Establishes an Institutional Biosafety Committee (IBC) or equivalent. The IBC must:</p> <p>(i) Review any work with biological etiologic agents for compliance with applicable Center for Disease Control (CDC), National Institutes of Health (NIH), World Health Organization (WHO), and other international, federal, state, and local guidelines and assess the containment level, facilities, procedures, practices, and training and expertise of personnel; and</p> <p>(ii) Review the site's security, safeguards, and emergency management plans and procedures to ensure they adequately consider work involving biological etiologic agents.</p> <p>(2) Maintains an inventory and status of biological etiologic agents, and provide to the responsible field and area office, through the laboratory IBC (or its equivalent), an annual status report describing the status and inventory of biological etiologic agents and the biological safety program.</p> <p>(3) Provides for submission to the appropriate Head of DOE Field Element, for review and concurrence before transmittal to the Center for Disease Control (CDC), each Laboratory Registration/Select Agent Program registration application package requesting registration of a laboratory facility for the purpose of transferring, receiving, or handling biological select agents.</p> <p>(4) Provides for submission to the appropriate Head of DOE Field Element, a copy of each CDC Form EA-101, Transfer of Select Agents, upon initial submission of the Form EA-101 to a vendor or other supplier requesting or ordering a biological select agent for transfer, receipt, and handling in the registered facility. Submit to the appropriate Head of DOE Field Element the completed copy of the Form EA-101, documenting final disposition and/or destruction of the select agent, within 10 days of completion of the Form EA-101.</p> <p>(5) Confirms that the site safeguards and security plans and emergency management programs address biological etiologic agents, with particular emphasis on biological select agents.</p> <p>(6) Establishes an immunization policy for personnel working with biological etiologic agents based on the evaluation of risk and benefit of immunization.</p>	<p>App. F7 Biological Safety</p>
<p>App. A8</p>	<p>Occupational Medicine.</p> <p>(a) Contractors must establish and provide comprehensive occupational medicine services to workers employed at a covered work place who:</p> <p>(i) Work on a DOE site for more than 30 days in a 12-month period; or</p> <p>(ii) Are enrolled for any length of time in a medical or exposure monitoring program required by this rule and/or any other applicable federal, state, or local regulation, or other obligation.</p> <p>(b) The occupational medicine services must be under the direction of a graduate of a school of medicine or osteopathy and licensed for the practice of medicine in the state in which the site is located.</p> <p>(c) Occupational medical physicians, occupational health nurses, physician's assistants, nurse practitioners, psychologists, employee assistance counselors, and other occupational health personnel providing occupational medicine services must be licensed, registered, or certified as required by federal or</p>	<p>App. F8 Occupational Medicine</p>

	<p>state law where employed.</p> <p>(d) Contractors must provide the occupational medicine providers access to hazard information by promoting its communication, coordination, and sharing among operating and environment, safety, and health protection organizations.</p> <p>(1) Contractors must provide the occupational medicine providers with access to information on the following:</p> <p>(i) Current information about actual or potential work-related site hazards (chemical, radiological, physical, biological, or ergonomic);</p> <p>(ii) Employee job-task and hazard analysis information, including essential job functions;</p> <p>(iii) Actual or potential work-site exposures of each employee; and</p> <p>(iv) Personnel actions resulting in a change of job functions, hazards or exposures.</p> <p>(2) Contractors must notify the occupational medicine providers when an employee has been absent because of an injury or illness for more than 5 consecutive workdays (or an equivalent time period for those individuals on an alternative work schedule);</p> <p>(3) Contractors must provide the occupational medicine provider information on, and the opportunity to participate in, worker safety and health team meetings and committees;</p> <p>(4) Contractors must provide occupational medicine providers access to the workplace for evaluation of job conditions and issues relating to workers' health.</p> <p>(e) A designated occupational medicine provider must:</p> <p>(1) Plan and implement the occupation medicine services; and</p> <p>(2) Participate in worker protection teams to build and maintain necessary partnerships among workers, their representatives, managers, and safety and health protection specialists in establishing and maintaining a safe and healthful workplace.</p>	
<p>App. A8 (Continued)</p>	<p>(f) A record, containing any medical, health history, exposure history, and demographic data collected for the occupational medicine purposes, must be developed and maintained for each employee for whom medical services are provided. All occupational medical records must be maintained in accordance with Executive Order 13335, Incentives for the Use of Health Information Technology.</p> <p>(1) Employee medical, psychological, and employee assistance program (EAP) records must be kept confidential, protected from unauthorized access, and stored under 341 conditions that ensure their long-term preservation. Psychological records must be maintained separately from medical records and in the custody the designated psychologist in accordance with 10 CFR 712.38(b)(2).</p> <p>(2) Access to these records must be provided in accordance with DOE regulations implementing the Privacy Act and the Energy Employees Occupational Illness Compensation Program Act.</p> <p>(g) The occupational medicine services provider must determine the content of the worker health evaluations, which must be conducted under the direction of a licensed physician, in accordance with current sound and acceptable medical practices and all pertinent statutory and regulatory requirements, such as the Americans with Disabilities Act.</p> <p>(1) Workers must be informed of the purpose and nature of the medical evaluations and tests offered by the occupational medicine provider.</p> <p>(i) The purpose, nature and results of evaluations and tests must be clearly communicated verbally and in writing to each worker provided testing;</p>	<p>App. F8 Occupational Medicine</p>

	<p>(ii) The communication must be documented in the worker’s medical record; and</p> <p>(2) The following health evaluations must be conducted when determined necessary by the occupational medicine provider for the purpose of providing initial and continuing assessment of employee fitness for duty.</p> <p>(i) At the time of employment entrance or transfer to a job with new functions and hazards, a medical placement evaluation of the individual’s general health and physical and psychological capacity to perform work will establish a baseline record of physical condition and assure (ii) Periodic, hazard-based medical monitoring or qualification-based fitness for duty evaluations required by regulations and standards, or as recommended by the occupational medicine services provider, will be provided on the frequency required.</p> <p>(iii) Diagnostic examinations will evaluate employee’s injuries and illnesses to determine work-relatedness, the applicability of medical restrictions, and referral for definitive care, as appropriate.</p> <p>(iv) After a work-related injury or illness or an absence due to any injury or illness lasting 5 or more consecutive workdays (or an equivalent time period for those individuals on an alternative work schedule), a return to work evaluation will determine the individual’s physical and psychological capacity to perform work and return to duty.</p>	
<p>App. A8 (Continued)</p>	<p>(v) At the time of separation from employment, individuals shall be offered a general health evaluation to establish a record of physical condition.</p> <p>(h) The occupational medicine provider must monitor ill and injured workers to facilitate their rehabilitation and safe return to work and to minimize lost time and its associated costs.</p> <p>(1) The occupational medicine provider must place an individual under medical restrictions when health evaluations indicate that the worker should not perform certain job tasks. The occupational medicine provider must notify the worker and contractor management when employee work restrictions are imposed or removed.</p> <p>(i) Occupational medicine provider physician and medical staff must, on a timely basis, communicate results of health evaluations to management and safety and health protection specialists to facilitate the mitigation of worksite hazards.</p> <p>(j) The occupational medicine provider must include measures to identify and manage the principal preventable causes of premature morbidity and mortality affecting worker health and productivity.</p> <p>(1) The contractor must include programs to prevent and manage these causes of morbidity when evaluations demonstrate their cost effectiveness.</p> <p>(2) Contractors must make available to the occupational medicine provider appropriate access to information from health, disability, and other insurance plans (deidentified as necessary) in order to facilitate this process.</p> <p>(k) The occupational medicine services provider must review and approve the medical and behavioral aspects of employee counseling and health promotional programs, including the following types:</p> <p>(1) Contractor-sponsored or contractor-supported EAPs;</p> <p>(2) Contractor-sponsored or contractor-supported alcohol and other substance abuse rehabilitation programs; and</p> <p>(3) Contractor-sponsored or contractor-supported wellness programs.</p> <p>(4) The occupational medicine services provider must review the medical aspects of immunization programs, blood-borne pathogens programs, and bio-hazardous waste programs to evaluate their conformance to applicable guidelines.</p> <p>(5) The occupational medicine services provider must develop and periodically review medical emergency response procedures included in site emergency and disaster preparedness plans. The medical emergency responses must be integrated with nearby community emergency and disaster plans.</p>	<p>App. F8 Occupational Medicine</p>

<p>App. A9</p>	<p>Motor Vehicle Safety</p> <p>(a) Contractors must implement a motor vehicle safety program to protect the safety and health of all drivers and passengers in Government-owned or -leased motor vehicles and powered industrial equipment (i.e., fork trucks, tractors, platform lift trucks, and other similar specialized equipment powered by an electric motor or an internal combustion engine).</p> <p>(b) The contractor must tailor the motor vehicle safety program to the individual DOE site or facility, based on an analysis of the needs of that particular site or facility.</p> <p>(c) The motor vehicle safety program must address, as applicable to the contractor's operations:</p> <p>(1) Minimum licensing requirements (including appropriate testing and medical qualification) for personnel operating motor vehicles and powered industrial equipment;</p> <p>(2) Requirements for the use of seat belts and provision of other safety devices;</p> <p>(3) Training for specialty vehicle operators;</p> <p>(4) Requirements for motor vehicle maintenance and inspection;</p> <p>(5) Uniform traffic and pedestrian control devices and road signs;</p> <p>(6) On-site speed limits and other traffic rules;</p> <p>(7) Awareness campaigns and incentive programs to encourage safe driving; and</p> <p>(8) Enforcement provisions.</p>	<p>App. F9 Motor Vehicle Safety</p>
<p>App. A10.</p>	<p>Electrical Safety.</p> <p>Contractors must implement a comprehensive electrical safety program appropriate for the activities at their site. This program must meet the applicable electrical safety codes and standards referenced in §851.23.</p>	<p>App. F10 Electrical Safety</p>

Appendix E

List of Closure Facility Hazards and Controls

Building	Reason For Closure	Hazard	Control
005	Old Town – Planned Demo Phase 1		Operating. Planned Shutdown in FY2014. Planned Disposition in FY2015.
016	Old Town – Planned Demo Phase 1		Operating. Planned Shutdown in FY2014. Planned Disposition in FY2015.
16A	Old Town – Planned Demo Phase 1		Operating. Planned Shutdown in FY2014. Planned Disposition in FY2015.
004	Old Town – Planned Demo Phase 2		Operating.
014	Old Town – Planned Demo Phase 2		Operating.
007	Old Town – Planned Demo Phase 3 Real Property Trailer. Obsolete		Operating.
007C	Old Town – Planned Demo Phase 3		Operating.
73	Obsolete	Seismic	Shutdown pending Disposal. Rated seismically “very poor.” 0% occupancy as of December 2008. Bldg. 73 is used for storage with controlled access.
73A	Obsolete	n/a	Shutdown pending Disposal. Unoccupied 400 sq. ft. utility equipment building.
75E	Obsolete	n/a	Shutdown pending Disposal. Building is locked. Access is controlled by Facilities Division.
90 P	Real Property Trailer. Obsolete.		Operating. Planned Disposition in FY2027.

Per FIMS database, as of May 2014

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Appendix F

Worker Safety & Health Functional Areas

The documents that are cited in this appendix are incorporated by reference, not including the references cited in the incorporated documents. Citations of specific sections of the ES&H Manual, the RPM, or PUB-3111 refer to the most current version of these documents as of the date of publication of this document, the Berkeley Lab WSHP.

1 Construction Safety

The Berkeley Lab Construction Safety Program is governed by ISMS principles. Construction work performed by Berkeley Lab workers complies with 10 CFR 851, 29 CFR 1926, applicable portions of 29 CFR 1910 (except 29 CFR 1910.1096), and Title 8 California Code of Regulations, Construction Safety Orders. Construction subcontractors, labor-only subcontractors, and Berkeley Lab workers may perform construction work at LBNL.

[ES&H Manual, Chapter 10](#), describes how the ISMS functions are applied to Laboratory work, including construction work, and identifies the documentation that is required for work activities. Such documentation includes:

- JHA prior to commencement of affected work ([Work Process C.1](#)), that addresses:
 - Identification of foreseeable hazards and planned protective measures;
 - Further hazards revealed by supplemental site information;
 - Provision of drawings and/or other documentation of protective measures for which applicable OSHA standards require preparation by a professional Engineer or other qualified professional; and
 - Identification of competent persons required for workplace inspections of the construction activity, where required by OSHA standards ([Work Process D](#)).
 - Subcontractor Safety Plans, training records, etc.
- Review of safety performance as part of contractor selection ([Work Process B](#))
- Subcontractor Injury & Illness Prevention Program (IIPP)

An essential element of Berkeley Lab's requirements for subcontractors is that during periods of active construction, subcontractors must ensure that an appropriately qualified designated representative who is knowledgeable of the project's hazards and has full authority to act on behalf of the construction subcontractor. The

subcontractor's designated representative must make frequent and regular inspections of the construction worksite to identify and correct any instances of noncompliance with the project health and safety requirements. Workers are required to report hazards not previously identified or evaluated to the designated representative. If immediate corrective action is not possible or the hazard falls outside of the project scope, the construction subcontractor must immediately Stop Work, notify affected workers, contact the Berkeley Lab Construction Manager, post appropriate warning signs and, implement needed interim control measures. The subcontractor or the designated representative must stop work in the affected area until appropriate protective measures are established. Any employee who observes an imminent danger situation is responsible for stopping the work and reporting the situation to the subcontractor designated representative ([Work Process H](#)).

Berkeley Lab's "[Construction Guidelines: Standard Project Specifications](#)", establishes standard procurement specifications for bidders of construction projects. Division 01 "General Requirements", [Section 013529 "Environment, Safety & Health Procedures"](#) establishes the LBNL Procured Services ES&H Program, which is used to manage subcontractors who provide construction services. This program extends the ISMS to LBNL subcontractors.

Subcontractors are responsible for the flow down of safety and health requirements to their lower-tier subcontractors and the safety and health interactions with them (Section 013529).

Berkeley Lab's "[Construction Guidelines: Standard Project Specifications](#)", also contains requirements and guidance for LBNL project planners and authorizing organizations in managing the facility design and construction process including:

- Management of facility design and construction activities, including modification to existing facilities and equipment, from conceptual design through construction
- Flow down of safety and health requirements to facility design and construction subcontracts
- Hazard identification and risk assessment in facility design and construction
- Facility design considerations that are unique to LBNL
- Provision of OSHA required drawings
- Safety notes

Each subcontractor is required to provide trained and qualified Competent or Qualified Persons as required by OSHA standards to oversee activities such as asbestos work, hazardous waste operations, excavation work, use of cranes, entry into confined spaces, fall protection, steel erection, and scaffolding.

Safety training in hazard recognition and control provides a valuable support function for the ISMS principles. Construction safety training at LBNL includes:

- Pre-job safety orientation
- Tailgate safety meetings (Toolbox Talks)
- Safety Instructions for employees

2 Fire Protection

Berkeley Lab has an established, comprehensive Fire Safety and Emergency Response Program designed to protect workers. The program includes appropriate facility and site-wide fire protection, fire alarm notification and egress features, and a fully staffed, trained, and equipped emergency response organization that is capable of responding in a timely and effective manner to site emergencies.

The Berkeley Lab Fire Protection Program implements DOE Order 420.1, DOE Order 440.1A, and all other DOE-prescribed fire protection codes and standards that are applicable to the Laboratory, including those adopted as EHS References, e.g., National Fire Protection Association (NFPA) standards. Assessments of the Fire Protection Program conducted in 2008, 2010 and 2012 identified deficiencies in this program which are being resolved through a BSO approved CAP.

The Berkeley Lab Fire Safety and Emergency Response Programs are implemented by the following Laboratory documents.

- The Berkeley Lab [Fire Protection Program](#), dated November 2013, (Appendix A of EHS Manual Chapter 12) describes the Berkeley Lab Fire Protection Program, including the fire protection organization, training, responsibilities, and requirements for the design, installation, operability, and testing of fire protection systems.
- [EHS Manual, Chapter 12](#) contains requirements for the design, installation, and testing of fire protection systems; guidance to help Laboratory staff comply with DOE and Berkeley Lab fire protection criteria; Hot Work Permit requirements ([Section 12. 6, Work Process H.](#)); and responsibilities.

- Fire Hazard Analyses (FHAs) are being updated for major facilities and can be obtained from Berkeley Lab Fire Protection.

The Baseline Needs Assessment (BNA), was most recently updated on October 1, 2013 and, reviewed the staffing levels, training, drills, contractual requirements, procedures, communications, structural, and wildland equipment and interaction with Berkeley Lab's Emergency Preparedness Program. The study concluded that our subcontractor, ACFD, had a thorough training program with very capable staff, well equipped to respond to emergencies at the Laboratory, extensively capable of mitigating hazardous materials incidents with adequate staffing levels. Recommendations were made to develop methods of reduce reflex time to achieve response time criteria.

3 Explosives Safety (Not Applicable at Berkeley Lab)

Explosives safety requirements per 851 are not applicable at Berkeley Lab because there is only a minor amount of chemicals on the site, in small quantities, that may exhibit the characteristics of explosive as defined in DOE Manual 440.1-1A, "DOE Explosives Safety Manual, Contractor Requirements Document (Attachment 2), January 9, 2006. However, these chemicals are not used to detonate or deflagrate, but rather are being studied for their chemical properties. These chemicals are handled and controlled in the same safe manner as other reactive chemicals used at Berkeley Lab (such as peroxides) as outlined in the chemical hygiene plan at:

<http://www.lbl.gov/ehs/chsp/html/reactives.shtml>.

4 Pressure Safety

Authority and responsibility for pressure safety at Berkeley Lab is shared among Research, Engineering, Facilities, and EHS divisions. Berkeley Lab defines pressure system hazards; requires training of operators of systems; provides guidelines on system design, testing, and assembly; adopts applicable codes and standards; and provides guidelines for designers and users.

Specific elements of the Berkeley Lab pressure safety program applicable to this WSHP include:

- ES&H Manual, Chapter 7, Sections 7.6 (Work Process A *et seq*) and 7.9 (Appendix A *et seq*). (Note: source requirements and additional references listed in Section 7.8 are NOT incorporated into this WSHP).
- Adoption of ASME Boiler and Pressure Vessel Code, ANSI B31 Code for Pressure Piping, and California Unfired Pressure Vessel Safety Orders for nonresearch systems.

Policies and procedures are provided for designing (including design review), testing, and assembling research pressure systems. When required, a Safety Note documents a system's engineering design and defines its operating parameters, as well as pressure test procedures, to assure the safety of employees using the system. For commercial systems, vendor documentation may be substituted for a Safety Note; those systems designed in-house and/or assembled from available components require an engineering review and, possibly, a Safety Note, as determined by the Subject Matter Expert and/or the designated Pressure Engineer. Safety Notes or the equivalent vendor's documentation must be approved by the Engineering Division Director or his or her designated Pressure Engineer.

An AHD is typically required for high-hazard pressure systems when:

- The material contained in the pressure system is hazardous (as defined in Section 7.6 Work Process D) and requires an AHD or the system will operate above 150 psig.
- The responsible designer has determined that the system poses pressure or process hazards that demand an AHD.

An AHD is optional for pressure systems not involving pressure equal to or less than 150 psig and/or the use of hazardous materials, chemicals, or reaction products. AHDs for pressure systems require review by the Engineering Division Director or his or her designee.

5 Firearms Safety (Not Applicable at LBNL)

Firearms are expressly forbidden on any Berkeley Lab work location.

6 Industrial Hygiene

The Berkeley Lab Industrial Hygiene Program is managed and implemented by a team of professionally and technically qualified industrial hygienists. The program is designed to protect workers from hazardous exposures to chemicals, biohazards and physical agents.

The Industrial Hygiene Program is implemented through the Health and Safety Department in the EHS Division. Staff industrial hygienists are responsible for assisting line management with implementation of institutional policies and procedures.

The Industrial Hygiene Program is governed through ISMS and implemented through several chapters in the Berkeley Lab ES&H Manual. Key elements of the Industrial Hygiene Program include:

- Exposure assessments and industrial hygiene surveys performed as part of the hazard identification and assessment methodology discussed in Chapter 4 of the Berkeley Lab ES&H Manual. Industrial hygiene is only one aspect of the Berkeley Lab's multidisciplinary approach to hazard assessment and is integral to the development and review of many safety documents. All work activities at Berkeley Lab follow the ISMS model, which includes collaboration with:
 - Planning and design personnel to anticipate and control health hazards that proposed facilities and operations would introduce, and
 - Cognizant occupational medical, environmental, health physics, and work planning professionals.
- The Chemical Hygiene and Safety Plan (CHSP) per Chapter 45 of the Berkeley Lab's ES&H Manual. It incorporates both OSHA's Lab and Hazard Communication Standards in conformance with 29 CFR 1910.1200 and 29 CFR 1910.1450. The plan addresses occupational exposure to hazardous chemicals in laboratory, shop, and office settings. Key elements of the CHSP include:
 - General requirements and an overview for planning the acquisition, safe use, handling, storage, inventory management, and disposal of hazardous chemicals used in laboratories and shops.
 - Mitigation of risk from known and potential occupational carcinogens in laboratories. As such, it complements, replaces, or supersedes other OSHA substance specific standards as applicable to laboratory activities.
 - Required Chemical Safety (Hazard Communication) training, which is incorporated into online course EHS10 (Overview of Environment, Safety, and Health at Berkeley Lab). Workers with greater potential for exposure to chemical hazards are also required to take EHS 348, Chemical Hygiene Safety Training.

- Requirements for the selection, use, and maintenance of personal protective equipment and respiratory protective equipment at the Berkeley Lab. Requirements are based on OSHA, NIOSH, and ANSI standards.

7 Biological Safety

Work with biological etiologic agents and any select agents at Berkeley Lab is conducted in a safe, environmentally sound, and compliant manner using the principles and functions of ISM and work authorization. Line managers and researchers define their biological work, evaluate the biological hazards, determine the risk, and implement required biosafety containment controls (e.g., establish a Biosafety Level). This is accomplished with the assistance and oversight of the Institutional Biosafety Committee (IBC), EHS Division (e.g., Health & Safety, Waste Management, and Health Services), and other Berkeley Lab ES&H functions as part of the biological safety program.

Reference:

- [ES&H Manual *Biosafety* program, Chapter 26.D.2](#) (Future reference in 2014: Chapter 26.A.2)

Biological etiologic agents and select agents are agents of biological origin (e.g., bacterium, fungus, parasite, virus, etc.) that cause disease in humans (i.e., are pathogenic to humans). See [Appendix B](#) of the NIH Guidelines for a list and risk-group categorization of human etiologic agents. Agents requiring implementation of Biosafety Level 3 or 4 containment are not used or stored at Berkeley Lab.

Reference:

- ES&H Manual *Biosafety* program, [Chapter 26.D.3.1](#) (Future reference in 2014: Chapter 26.A.3.1)

The term “select agents” is commonly used to describe a list of specific pathogenic agents that are strictly regulated by the Centers for Disease Control and Prevention (CDC) and U.S. Department of Agriculture (USDA) because they may potentially be used as biological weapons or pose a severe threat to human, animal, and plant health.

Reference:

- [ES&H Manual *Biosafety* program, Chapter 26.D.3.2](#) (Future reference in 2014: Chapter 26.A.3.2)

Berkeley Lab's biological safety program for managing biological etiologic agents and select agents under this WSHP includes the program elements listed below:

1. Berkeley Lab's Institutional Biosafety Committee (IBC) reviews the following work, plans, and procedures:
 - Work Review and Assessment: The IBC (a) reviews work with biological etiologic agents for compliance with applicable CDC, NIH, WHO, and other international, federal, state, and local guidelines that are applicable to biological etiologic agents, and (b) assesses the containment level, facilities, procedures, practices, and training and expertise of personnel using these agents.

Reference:

- [ES&H Manual *Biosafety* program, Chapter 26.D.4.1](#) (Future reference in 2014: ES&H Manual *Biosafety* program, Chapter 26.A.4.1.a)
- Security, Safeguards, and Emergency Management Plan and Procedure Review. The IBC reviews Berkeley Lab's security, safeguards, and emergency management plans and procedures to ensure they adequately consider work involving biological etiologic agents.

Reference:

- [ES&H Manual *Biosafety* program, Chapter 26.D.4.1](#) (Future reference in 2014: Chapter 26.A.4.1.b)

2. Agent Inventory and Status Report. The EHS Health & Safety Research Support Team maintains an inventory and status of biological etiologic agents, and provides DOE-SC BSO (through the LBNL IBC) an annual status report describing the status and inventory of biological etiologic agents and Berkeley Lab biological safety program.

Reference:

- [ES&H Manual *Biosafety* program, Chapter 26.D.4.2](#) (Future reference in 2014: Chapter 26.A.4.2)

3. Select Agent Application for Registration. LBNL did not possess or have plans to possess select agents at the time this WSHP was revised. If LBNL researchers

request use of a select agent, the requirements in this Biological Safety section related to select agents will be implemented. The Berkeley Lab select agent EHS Responsible Official (RO) or Alternate Responsible Official (ARO) requests the registration of a new laboratory facility for the purpose of transferring, receiving, or handling select agents by submitting each CDC Laboratory Registration/Select Agent Program registration application package to DOE-SC BSO. DOE's review and concurrence is required before transmittal of select agents to the CDC.

Reference:

- [ES&H Manual Biosafety program, Chapter 26.D.4.3](#) (Future reference in 2014: Chapter 26.A.4.3)
4. Select Agent Transfer, Disposition, and/or Destruction. The Berkeley Lab select agent EHS RO or ARO submits to the DOE BSO:
- A copy of each CDC Transfer of Select Agents form (a) upon initial submission of the form to a vendor or other supplier requesting or ordering a select agent for transfer, receipt, and handling in a registered facility, and (b) within 10 days upon completion of the form documenting final disposition of the select agent.
 - Documentation of the destruction of a complete stock of a select agent within 10 days of the destruction.

Reference:

- [ES&H Manual Biosafety program, Chapter 26.D.4.4](#) (Future reference in 2014: Chapter 26.A.4.4)
5. Safeguards, Security, and Emergency Management Plans and/or Program Confirmation. The Protective Services Department's Security and Emergency Services and EHS Health & Safety Research Support Team confirm that the site safeguards and security plans and emergency management programs address biological etiologic agents with particular emphasis on any biological select agents.

Reference:

- [ES&H Manual Biosafety program, Chapter 26.D.4.5](#) (Future reference in 2014: Chapter 26.A.4.5)

6. Immunization Policy. The IBC (which includes the Berkeley Lab Medical Director and Biosafety Officer) assesses potential vaccines and the need for immunizations when it reviews work to be conducted with biological etiologic agents. Any immunization requirements are then incorporated into the operation's biosafety documentation.

Reference:

- [ES&H Manual *Biosafety program*, Chapter 26.D.4.6](#) (Future reference in 2014: Chapter 26.A.4.6)

8 Occupational Medicine

Berkeley Lab's Occupational Medical Program offers services that help protect workers from occupational hazards, promote health and disease prevention, and treat and manage work-related injuries and illnesses. The program is described by [ES&H Manual, Chapter 3](#).

Comprehensive occupational medical services are provided by Berkeley Lab Health Services, an Accreditation Association for Ambulatory Health Care-accredited organization, to Laboratory employees as required by applicable federal, state, and local regulations and other obligations. The Health Services program manages medical surveillance programs periodic health evaluations, first aid, and case management; assesses injuries, illnesses, and makes appropriate referrals; and contributes to health promotion through its Wellness Program. The program staff works closely with other EHS staff to operate the Medical Surveillance Program, and with staff from Human Resources to help implement the Laboratory's Return-to-Work Policy ([ES&H Manual, Chapter 3, Section 3.2](#))

The Health Services Credentialing and Privileging Policy ensures that physicians, nurses, nurse practitioners, and other occupational health personnel providing occupational medical services are licensed, registered, or certified as required by federal or state law.

Additional background information may also be checked for certain positions requiring additional review as described in the Berkeley Lab Background Checks Requirements. This list is maintained by the Labor and Employee Relations Unit of the Human Resources Department. ([RPM, Section 2.01 \(E\)\(6\)\(a\)](#))

6.1 Role of Health Services in the Berkeley Lab ES&H Program

Health Services provides collaborative support to employees, managers, and other safety and health specialists to help ensure that Berkeley Lab is a safe and healthy workplace. Health Services clinicians visit work areas to observe general health-related conditions, look for possible hazards and potential health problems, participate in worker safety and health team meetings and committees when appropriate, and assist with any health issues.

Information obtained from worksite visits is used along with baseline worker health information to prepare for routine and emergency medical care. Recommendations for medical surveillance and medical restrictions are based on clinicians' direct knowledge of the workplace, exposure levels, and other conditions as determined in collaboration with other appropriate health and safety disciplines. ([ES&H Manual, Chapter 3, Section 3.9](#)).

6.2 Injury and Illness Care

Health Services provides diagnostic examinations to evaluate injuries and illnesses to determine work-relatedness, apply appropriate medical restrictions, and refer for definitive care, as appropriate. Health Services monitors ill and injured workers to facilitate recovery and safe return to work, and to minimize lost time and associated costs.

The Berkeley Lab Return-to-Work Policy requires employees returning to work after one full day or more of lost time due to work-related illness or injury to report to Health Services for an evaluation of their condition and ability to resume customary work. Employees who have been absent for five or more consecutive workdays due to non-occupational illness or injury are also required to report to Health Services with a release to return to work so that their ability to return to work can be determined. This release must include any information regarding medical restrictions that may affect the employee's ability to perform his or her job, as certified by the treating physician. Additionally, Health Services may, at the discretion of the Site Occupational Medical Director, request an employee be evaluated at Health Services following a significant health event that falls outside the above requirements but has the potential to significantly impact the employee's ability to work safely [[ES&H Manual, Chapter 3, Section 3.11](#) and [RPM Section 1.12 \(A\)\(2\) & 2.09\(D\)\(11\)](#)].

Work restrictions may be placed on an employee's work based on the results of his or her physical examination, illness, or injury. In some cases, Health Services may recommend restrictions on an employee's work assignment or

activities and advise line management, the Return to Work Coordinator, and the Human Resources Center, who are jointly responsible for working out, if possible, an accommodation to the restrictions [[ES&H Manual, Chapter 3, Section 3.13](#) and [RPM Section 2.09\(D\)\(11\)](#)].

6.3 Medical Evaluations

Medical evaluations are sometimes necessary to ensure that an employee meets specific physical, medical, and psychological requirements for a given work assignment. The Health Services Medical Surveillance Program provides hazard-based medical monitoring and qualifications-based medical certification examinations at frequencies required by standards and regulations, and when recommended by the Site Occupational Medical Director. These examinations and laboratory evaluations are designed to monitor and protect employees who may be at risk from health hazards at work. All examinations are conducted under the direction of a licensed physician, in accordance with current sound and acceptable medical practices and all pertinent statutory and regulatory requirements, including the Americans with Disabilities Act ([Health Services Policy and Procedures for Occupational Medical Testing Lawrence Berkeley National Laboratory.](#))

Reference:

- ES&H Manual, Chapter 3, Section 3.9 and RPM Section 1.12 (A)(1)

6.4 Health Information Management

Complete medical records are maintained for employees from the time of their first physical examination. These records are confidential to the extent provided by law and remain in the custody and control of Health Services. Personal health information from an employee's health records may be disclosed only as required by law or if an employee provides written consent for release of information. Records are retained indefinitely ([ES&H Manual, Chapter 3, Sections 3.12](#)).

The Employee Assistance program, an off-site program provided by the University of California Health Center (the Tang Center) on the UC Berkeley campus, offers confidential consultation, assessment, and referral for personal or work-related problems. These records are maintained separately at the Tang Center and are confidential to the extent provided by law ([ES&H Manual, Chapter 3, Sections 3.19](#)).

6.5 Health Education and Promotion Programs

Immunizations are available to employees who require such protection during the course of their work at the Laboratory or during work-related travel. Yearly immunization against influenza may be offered to all employees ([ES&H Manual, Chapter 2, Section 3.20](#)).

The Employee Assistance Program (EAP) provides assistance to employees with personal and organizational issues (e.g., work problems, substance abuse, family conflict, grieving the loss of a family member or friend, crisis intervention, alcohol/substance abuse rehabilitation). The EAP also provides employees and their families with short-term counseling, referrals, and consultation [[ES&H Manual, Chapter 3, Sections 3.19](#) & [RPM Section 1.12\(B\)](#)]. The Laboratory and EAP will work with employees and provide the necessary support for those who experience mental health issues due to stress or hardships experienced at work or at home.

Health Services maintains an active role in developing and periodically reviewing the medical portion of the Berkeley Lab Emergency Plan. Health Services serves on appropriate Laboratory emergency planning committees and regularly participates in emergency drills and exercises involving medical victims. Health Services also works closely with medical personnel in Alameda County through its countywide Emergency Management Services (EMS) Plan. Detailed information about the EMS Plan is contained in [LBNL Master Emergency Management Plan](#).

9 Motor Vehicle Safety

The Berkeley Lab Motor Vehicle Safety Program applies to vehicles that are government-owned, leased, rented, and privately owned operated on the Berkeley Lab main site. The program also applies to vehicles used for driving off site on Berkeley Lab business.

Each new employee, guest, or contract worker is required to sign the "LBNL Environment, Health, and Safety Work Agreement" (<http://www.lbl.gov/ehs/pub811/agreement.html>). The ES&H Manual, Traffic and Pedestrian Safety Program, addresses vehicle safety tailored to the Berkeley Lab Main Site.

Motor vehicle use includes motorized carts, motorcycles, cars, vans, trucks [1/2 ton to 80,000 pounds gross vehicular weight [(GVW)], commuter vans and buses, tractors, specialized vehicles, forklifts, motorized pallet lifts, mobile cranes, boom lifts, scissors lifts, bucket trucks, and upright lifts.

ES&H Manual, Traffic Safety Program, and the RPM, Traffic and Pedestrian Safety Policy, establish requirements for the safe use, operation, and parking of vehicles and bicycles. ES&H Manual, Cranes, Hoists and Rigging Safety Program, and Forklifts and Other Powered Industrial Truck Safety Program, provide requirements for training and certification of crane operators and forklifts respectively.

Specific requirements for the use of official vehicles are defined in RPM, Use of Laboratory or Government Vehicles Policy . Drivers of official Laboratory vehicles must hold a valid California driver license for the class of vehicle that they are authorized to operate.

In accordance with the California seatbelt law, all employees riding in Laboratory-furnished vehicles (or in personal vehicles on official Laboratory business) must wear seatbelts at all times. The driver must not operate the vehicle until everyone has fastened their seatbelts

The Berkeley Lab policies on the operation of motor vehicles is in accordance with the California Vehicle Code, the University of California, and the City of Berkeley traffic code. The primary objective of the Berkeley Lab traffic program is to provide a safe environment for both the driver and the pedestrian community. Safe use requirements are defined in RPM, Traffic and Pedestrian Safety Policy.

As a general guide, the speed limit on Laboratory or University property is 40 km/hr (25 mph) unless otherwise posted. Temporary conditions such as road repair, wet weather, poor visibility, and pedestrian traffic require a reduction in speed (ES&H Manual, Traffic and Pedestrian Safety Program, Work Process A, General Requirements).

All Berkeley Lab cars are leased from General Services Administration (GSA) Sacramento Fleet Management Center. GSA maintains a record of the Periodic Preventative Maintenance (PM) performed on all leased Laboratory vehicles, as well as the "PM Due" parameters. GSA informs Berkeley lab whenever routine maintenance is needed for vehicles, and the Berkeley Lab Facilities Division performs the required servicing. Berkeley Lab has a management procedure which oversees and supplements the GSA program.

The Laboratory ensures the uniformity of traffic and pedestrian control devices and road signs by adhering to the standards set by Title 3 (Highways), Chapter I (Federal Highway Administration, Department of Transportation), Part 5 (Traffic Operations), which is included by reference in the California Vehicle Code.

Berkeley Lab has demonstrated its commitment to safety for both motor vehicles and bicycles by establishing the [Traffic and Pedestrian Safety Committee](#) (TPSC), which provides oversight of the traffic safety program and assists in the implementation of traffic safety improvement. The TC is composed of one or more representatives from the Facilities, EHS, and Human Resources divisions and the Directorate.

The Laboratory has also established a bicycle safety taskforce that partnered with the Berkeley Lab Bicycle Coalition to generate the [Berkeley Lab Bicycle Safety Policy](#).

Berkeley Lab takes the opportunities throughout the year to raise the awareness of drivers and bicyclists on the Berkeley Lab Main Site about the need to slow down and respect traffic signs. The Laboratory has elevated the importance of traffic safety by frequently publishing articles about vehicular traffic and bicycle safety awareness in Today at Berkeley Lab (TABL), the Laboratory's daily electronic newsletter; examples of recently published traffic safety articles include "Inspect Your Vehicle for Safety" and "Traffic and Pedestrian Safety Program: Bicycle Safety." Other articles can be found by searching www.lbl.gov/today/today-archives.html. Berkeley Lab has contracted with the UC Police Department to issue traffic citations for on-site violations of the CVC.

Several traffic, pedestrian and bicycle safety improvement projects have been identified through various studies, employee safety concerns and planned walk around activities. These proposed projects have been prioritized and vetted through the TPSC. A list of proposed projects for the coming fiscal year will be presented to Laboratory Leadership for funding consideration.

10 Electrical Safety

Berkeley Lab has an established, comprehensive Electrical Safety Program. Only trained and qualified Laboratory employees are authorized to work on Berkeley Lab electrical equipment and circuits. For construction subcontractors who perform electrical work at the Laboratory, only California State certified electricians and registered trainees working under the individual direction of a certified electrician are authorized to perform work.

The program is implemented by the following documents:

- [ES&H Manual , Chapter 8](#), which contains general requirements for all Berkeley Lab work involving the use of electrical equipment and systems including:
 - Application of engineering controls, PPE, and safe work practices
 - Electrical safety considerations
 - Energized electrical work requirements
 - Qualifying and authorizing personnel
 - Employee training

Note: Section 8.14 (Appendices) of Chapter 8 is not necessary for achieving compliance with 10 CFR 851 electrical safety requirements, and is not to be considered part of this compliance program.

- ES&H Manual, Chapter 8, [Sections 8.9.1](#) describes the current Berkeley Lab assignment of responsibility for the AHJ. Electrical Safety AHJ authority has been delegated to Berkeley Lab by the DOE-SC BSO Manager, as documented in her letter of January 29, 2014.
- The DOE Model Electrical Safety Program recommends that all DOE contractors establish an AHJ for electrical issues such as examining and approving electrical equipment that has not been tested by a nationally recognized testing laboratory (NRTL). In compliance with these requirements, Berkeley Lab has developed an internal AHJ Equipment Acceptance Program for ensuring that electrical equipment in use does not pose a serious threat of shock or fire.
- [ES&H Manual, Chapter 18](#), describes the Berkeley Lab Lockout/Tagout (LOTO) program. The primary purpose of the LOTO Program is to prevent unintended releases of hazardous energy associated with servicing, modifying, and maintaining equipment. When an unexpected energization (or start up) of equipment or the release of stored energy could occur and possibly result in injury, the requirements in this document are applied to ensure that equipment is stopped; all potentially hazardous energy sources are isolated and verified; and equipment is locked out and tagged out by each worker before workers begin service or maintenance. The LOTO program is implemented through LOTO procedures for shutting off and securing such equipment.

General electrical safety requirements are augmented by the development of work authorization documents such as Activity Hazard Documents and Facility Based Authorizations which further describe electrical hazards, applicable controls,

requirements for conducting hazardous experiments and operations safely, and responsibilities and training requirements for work activities.

11 Nanotechnology Safety

LBNL has safety control procedures for engineered nanomaterials. These were developed by the EHS Division Industrial Hygiene Group with input from the LBNL research community and are located within the Chemical Hygiene & Safety Plan section entitled "Control Procedures for Engineered Nanomaterials". The basis for these procedures has been codified through the ES&H Standards Process. Berkeley Lab's ES&H procedures are based on the DOE Nanoscale Science Research Centers guidance document entitled: "Approach to Nanomaterial ES&H, Revision 3a, May 2008".

Reference:

- [PUB-5341, Chemical Hygiene Plan](#), Control Procedures for Engineered Nanomaterials
- [DOE P 456.1, Secretarial Policy Statement on Nanoscale Safety](#)
- DOE O 456.1 The Safe Handling of Unbound Engineered Nanoparticles

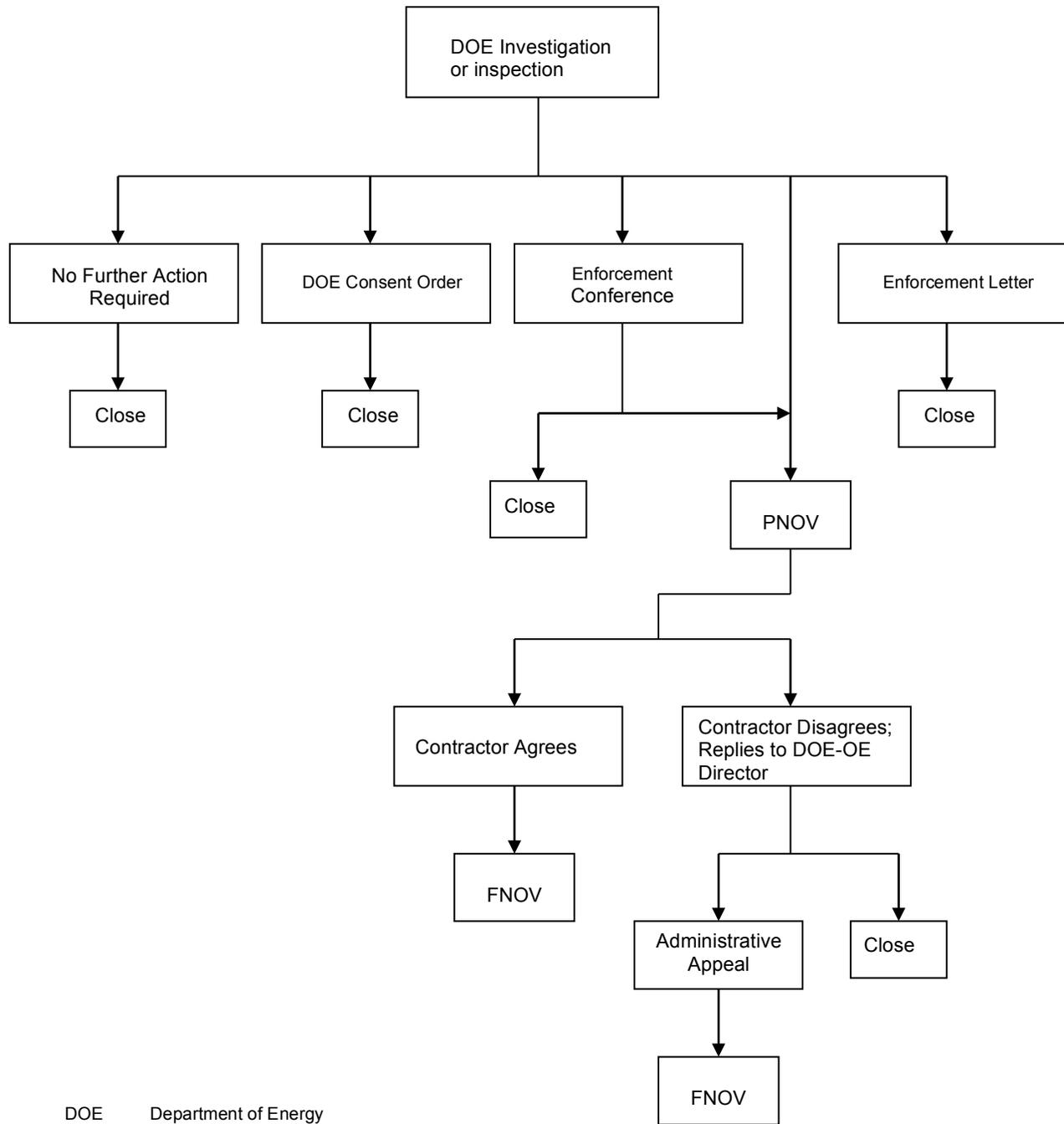
12 Workplace Violence Prevention

Berkeley Lab provides a community in which employees, affiliates (formally known as guests), and visitors can work together in an atmosphere of respect and civility, free of harassing and threatening behaviors. Laboratory policies are designed to protect and promote the rights of members of the Berkeley Lab community and to prevent actions that interfere with those rights and with the Laboratory's mission. Any threat or violent act by an individual associated with Berkeley Lab, including any employee, contractor, affiliate, or student, will be considered serious misconduct and may be the basis for disciplinary action or dismissal. Such an act may be reported to local law enforcement officials for appropriate action.

Reference:

- [RPM, Violence in the Workplace](#)

Appendix G 10 CFR 851 Enforcement Process Flowchart



- DOE Department of Energy
- DOE-OE DOE Office of Price-Anderson Enforcement
- NOV Notice of Violation
- PNOV Preliminary Notice of Violation

Figure G-1 The 10 CFR Enforcement Process